

THE "WHITEBOOK"



Standard Specifications



FOR PUBLIC WORKS CONSTRUCTION (2010 Edition)

INTRODUCTION

The 2010 edition of the City of San Diego Standard Specifications for Public Works Construction ("WHITEBOOK") now contains the following distinct Contract Documents:

- 1) ***Equal Opportunity Contracting Program Requirements*** - This Contract Document sets forth the requirements for the City's equal opportunity contracting program. When additional requirements by the funding source e.g., federal or state agencies are physically included in the contract documents or by reference and there is a discrepancy, the funding source requirements shall govern unless specified otherwise in the Special Provisions.
- 2) ***City Supplement*** – The City Supplement shall be used in conjunction with the Standard Specifications for Public Works Construction ("GREENBOOK"), 2009 Edition. The specifications contained in City Supplement take precedence over the specifications contained in GREENBOOK, 2009 Edition.

Certain parts of the City Supplement have been highlighted in yellow for the convenience of the users only and shall not affect the interpretation of the Contract.

PRINT ORDERS

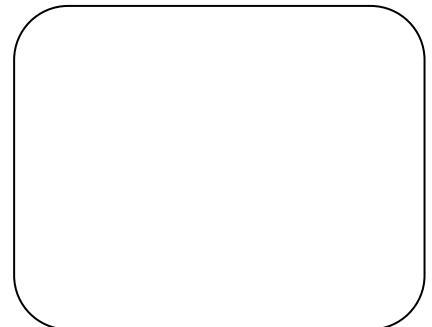
A limited number of hard copy editions will be available from the City (i.e., Development Services Department) at the time of adoption on a first come first served basis. Future requests from staff for additional prints should be directed to the City's Print Shop. Electronic copy of this document may also be obtained from the City's web site or by sending a request to the e-mail address below.

COMMENTS

The City of San Diego is committed to the quality of this publication and desires to correct any errors, omissions, or ambiguity. If you have any suggestions, comments, corrections, or additions you would like to submit for consideration to be included in the next publication, you may submit them to:

Standards & Specifications Engineer
Engineering and Capital Projects Department
1010 2nd Avenue, Suite 1200, M.S. 612
San Diego, CA 92101
or
mmaali@sandiego.gov

THIS COPY BELONGS TO: _____



ACKNOWLEDGEMENT

This edition is the product of an extensive team effort. Following is a list of staff members who contributed to the completion of this edition:

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CITY OF SAN DIEGO EQUAL OPPORTUNITY CONTRACTING PROGRAM REQUIREMENTS CONSTRUCTION CONTRACTOR REQUIREMENTS

- **THIS DOCUMENT SETS FORTH THE FOLLOWING SPECIFICATIONS:**
 1. **CITY OF SAN DIEGO'S GENERAL EQUAL OPPORTUNITY CONTRACTING PROGRAM FOR ALL CONSTRUCTION CONTRACTS.**
 2. **SPECIAL PROVISIONS FOR CONTRACTS SUBJECTS TO SLBE AND ELBE REQUIREMENTS ONLY.**
 3. **SPECIAL PROVISIONS FOR CONTRACTS SUBJECT TO SCOPe REQUIREMENTS ONLY.**

ADDITIONAL REQUIREMENTS MAY APPLY FOR STATE OR FEDERALLY FUNDED PROJECTS IN LIEU OF (2) AND (3) ABOVE.

- **SEE THE COVER OF THE SPECIFICATIONS TO IDENTIFY THE CONTRACT SPECIFIC REQUIREMENTS.**
- **THESE REQUIREMENTS SHALL BE INCLUDED AS CONTRACT PROVISIONS FOR ALL SUBCONTRACTS.**
- **THE CITY SPECIFIED FORMS ARE AVAILABLE FOR DOWNLOAD FROM THE EOC PROGRAM'S WEB SITE AT:**

<http://www.sandiego.gov/eoc/forms/index.shtml>

- **UNLESS SPECIFIED OTHERWISE, ALL EOC DOCUMENTATION REQUIRED PRIOR TO AWARD SHALL BE SUBMITTED TO AND LOGGED IN AT THE FOLLOWING ADDRESS:**

**Purchasing & Contracting Department
1200 Third Avenue, Suite 200
San Diego, CA 92101
Attention: Contract Specialist
Subject: _____**

GENERAL EQUAL OPPORTUNITY CONTRACTING PROGRAM REQUIREMENTS CONSTRUCTION CONTRACTOR REQUIREMENTS

THIS DOCUMENT SETS FORTH THE GENERAL REQUIREMENTS FOR THE CITY OF SAN DIEGO'S EQUAL OPPORTUNITY CONTRACTING PROGRAM. ADDITIONAL REQUIREMENTS MAY APPLY FOR STATE OR FEDERALLY FUNDED PROJECTS.

THESE REQUIREMENTS SHALL BE INCLUDED AS CONTRACT PROVISIONS FOR ALL SUBCONTRACTS.

- I. City's Equal Opportunity Commitment
 - II. Nondiscrimination in Contracting Ordinance
 - III. Equal Employment Opportunity Outreach Program
 - IV. Subcontracting
 - V. List of Subcontractors and Suppliers
 - VI. Listed Subcontractors and Suppliers Substitutions
 - VII. Prompt Payment
 - VIII. Prompt Payment of Funds Withheld To Subcontractors
 - IX. Definitions
 - X. Certifications
 - XI. Contract Records and Reports
- I. City's Equal Opportunity Commitment.** The City of San Diego promotes equal employment and subcontracting opportunities. The City is committed to ensuring that taxpayer dollars spent on public contracts are not paid to businesses that practice discrimination in employment or subcontracting. The City encourages all companies seeking to do business with the City to share this commitment.
- II. Nondiscrimination in Contracting Ordinance.** The Prime Contractors doing business with the City, and their subcontractors, shall comply with requirements of the City's *Nondiscrimination in Contracting Ordinance*, San Diego Municipal Code §§ 22.3501 through 22.3517.
- A. Disclosure of Discrimination Complaints. As part of its Bid or Proposal, Bidder shall provide to the City a list of all instances within the past 10 years where a complaint was filed or pending against Bidder in a legal or administrative proceeding alleging that Bidder discriminated against its employees, subcontractors, vendors, or suppliers, and a description of the status or resolution of that complaint, including any remedial action taken.
 - B. Contract Language. The following language shall be included in contracts for City projects between the Prime Contractor and Subcontractors and Suppliers:

“The Contractor shall not discriminate on the basis of race, gender, religion, national origin, ethnicity, sexual orientation, age, or disability in the solicitation, selection, hiring, or treatment of subcontractors, vendors, or suppliers. The Contractor shall provide equal opportunity for subcontractors to participate in subcontracting opportunities. The Contractor understands and agrees that violation of this clause shall be considered a material breach of the contract and may result in contract termination, debarment, or other sanctions.”

- C. Compliance Investigations. Upon the City's request, the Contractor agrees to provide to the City, within 60 days, a truthful and complete list of the names of all Subcontractors and Suppliers that the Contractor has used in the past 5 years on any of its contracts that were undertaken within San Diego County, including the total dollar amount paid by the Contractor for each subcontract or supply contract. The Contractor further agrees to fully cooperate in any investigation conducted by the City pursuant to the City's Nondiscrimination in Contracting Ordinance, Municipal Code §§ 22.3501 through 22.3517. The Contractor understands and agrees that violation of this clause shall be considered a material breach of the Contract and may result in remedies being ordered against the Contractor up to and including contract termination, debarment and other sanctions for violation of the provisions of the Nondiscrimination in Contracting Ordinance. The Contractor further understands and agrees that the procedures, remedies and sanctions provided for in the Nondiscrimination in Contracting Ordinance apply only to violations of the Ordinance.

III. Equal Employment Opportunity Outreach Program. All Prime Contractors doing business with the City, and their subcontractors, shall comply with the City's *Equal Employment Opportunity Outreach Program*, San Diego Municipal Code §§ 22.2701 through 22.2707.

- A. Competitive Bids. If a contract is competitively solicited, after the Apparent Low Bidder has been determined and prior to execution of any contract, that bidder shall submit a *Work Force Report (Form BB05)* or an Equal Employment Opportunity (EEO) Plan to the City's Equal Opportunity Contracting Program (EOCP) for approval.
- B. Work Force Report. If a Work Force Report is submitted, and EOCP determines there are under-representations when compared to County Labor Force Availability data, the Apparent Low Bidder shall submit an Equal Employment Opportunity Plan.
- C. Equal Employment Opportunity Plan. If the Apparent Low Bidder submits an Equal Employment Opportunity Plan, it shall include the following assurances:
1. The Contractor shall maintain a working environment free of discrimination, harassment, intimidation and coercion at all sites and in all facilities at which the Contractor's employees are assigned to work.
 2. The Contractor reviews its EEO Policy, at least annually, with all on-site supervisors involved in employment decisions.
 3. The Contractor disseminates and reviews its EEO Policy with all employees at least once a year, posts the policy statement and EEO posters on all company bulletin boards and job sites, and documents every dissemination, review and posting with a written record to identify the time, place, employees present, subject matter, and disposition of meetings.
 4. The Contractor reviews, at least annually, all supervisors' adherence to and performance under the EEO Policy and maintains written documentation of these reviews.
 5. The Contractor discusses its EEO Policy Statement with subcontractors with whom it anticipates doing business, includes the EEO Policy Statement in its subcontracts, and provides such documentation to the City upon request.
 6. The Contractor documents and maintains a record of all bid solicitations and outreach efforts to and from subcontractors, contractor associations and other business associations.

7. The Contractor disseminates its EEO Policy externally through various media, including the media of people of color and women, in advertisements to recruit, maintains files documenting these efforts, and provides copies of these advertisements to the City upon request.
8. The Contractor disseminates its EEO Policy to union and community organizations.
9. The Contractor provides immediate written notification to the City when any union referral process has impeded the Contractor's efforts to maintain its EEO Policy.
10. The Contractor maintains a current list of recruitment sources, including those outreaching to people of color and women, and provides written notification of employment opportunities to these recruitment sources with a record of the organizations' responses.
11. The Contractor maintains a current file of names, addresses and phone numbers of each walk-in applicant, including people of color and women, and referrals from unions, recruitment sources, or community organizations with a description of the employment action taken.
12. The Contractor encourages all present employees, including people of color and women employees, to recruit others.
13. The Contractor maintains all employment selection process information with records of all tests and other selection criteria.
14. The Contractor develops and maintains documentation for on-the-job training opportunities, participates in training programs, or both for all of its employees, including people of color and women, and establishes apprenticeship, trainee, and upgrade programs relevant to the Contractor's employment needs.
15. The Contractor conducts, at least annually, an inventory and evaluation of all employees for promotional opportunities and encourages all employees to seek and prepare appropriately for such opportunities.
16. The Contractor ensures the company's working environment and activities are non-segregated except for providing separate or single-user toilets and necessary changing facilities to assure privacy between the sexes.

IV. Subcontracting.

The City encourages all eligible business enterprises to participate in City contracts as Prime Contractors, subcontractors, joint venture partners with Prime Contractor, Subcontractors, or Suppliers. The Contractors are encouraged to take positive steps to diversify and expand their subcontractor solicitation base and to offer subcontracting opportunities to all eligible business firms including MBEs, WBEs, DBEs, DVBES, and OBEs or ELBE and SLBE. (For definitions, see Paragraph IX).

For subcontractor participation level, see the Special Provisions for Contracts Subjects To SLBE and ELBE Requirements or Special Provisions For Contracts Subject To SCOPe Requirements and the Special Notice included in the Contract Documents where applicable for more information.

Each joint venture partner shall be responsible for a clearly defined scope of work. In addition, an agreement shall be submitted, signed by all parties, identifying the extent to which each joint venture partner shares in ownership, control, management, risk and profits of the joint venture.

V. Lists of Subcontractors and Suppliers.

Bidders shall comply with the Subletting and Subcontracting Fair Practices Act, Public Contract Code §§ 4100 through 4113, inclusive.

Bidders shall list all Subcontractors who will receive more than 0.5% of the total Bid amount or \$10,000, whichever is greater on the form provided in the Contract Documents i.e., a subcontractors list.

The subcontractor list shall include the Subcontractor's name, telephone number including area code, address, scope of work, the dollar amount of the proposed subcontract, Subcontractor's certification status, and name of the certifying agency.

The listed Subcontractor shall be licensed pursuant to the Contractor License Law.

For Design-Build Contracts, ADD the following:

Due to the unique nature of a Design-Build contract, the Design-Builder shall be required to list all known Subcontractors, including, at a minimum, the 3 largest Subcontractors for the Project at least 2 of which are the builders.

RFQ Stage:

The Design-Builder shall submit to the City with its Statement of Qualifications (SOQ) the listing of the Design-Builder's Subcontractor and Supplier participation levels achieved on all private and public projects within the past 3 years. Include name of project, type of project, value of project, Subcontractor firm's name, percentage of Subcontractor's participation, and identification of Subcontractor's ownership as a certified Disadvantaged Business Enterprise on the City provided forms:

1. Subcontractor Past Participation List (*Form AA50*)
2. Suppliers Past Participation List (*Form AA55*)
3. Work Force Report (*BB05*)

RFP Stage:

The Design-Builder shall submit to the City with its Proposal the listing of the Design-Builder's Subcontractor and Supplier participation levels in support of the goals specified in the RFP. Include name of project, type of project, value of project, Subcontractor or Supplier firm's name, percentage and value of Subcontractor's and Supplier's participation where applicable, and identification of Subcontractor's and Supplier's ownership as a certified Disadvantaged Business Enterprise on the City provided forms:

1. Design-Build List of Subcontractors (Non-Price Proposal) (*Form AA15*)
2. Design-Build List of Subcontractors (Price Proposal) (*Form AA05*)
3. Design-Build List of Subcontractors Additive/Deductive Alternates (Non-Price Proposal) (*Form AA20*)
4. Design-Build List of Subcontractors Additive/Deductive Alternates (Price Proposal) (*Form AA10*)
5. Design-Build Named Equipment/Material Supplier List (Non-Price Proposal) (*Form AA30*)
6. Design-Build Named Equipment/Material Supplier List (Price Proposal) (*Form AA25*)

Post Award:

The Design-Builder shall submit to the City the Contract Activity Report (Form CC05).

VI. Listed Subcontractor and Supplier Substitutions.

Listed Subcontractors and Suppliers shall not be substituted without the Express authorization of the City or its duly authorized agent.

A. Subcontractor Substitution.

Requests shall be made in writing to the Purchasing & Contracting Department, Attention Contracts Division, 1200 Third Avenue, Suite 200, San Diego, CA 92101 with a copy to the Engineer.

The request shall include a thorough explanation of the reason(s) for the substitution, including dollar amounts and a letter from each substituted Subcontractor stating that they (the Subcontractors) release all interest in working on the project, written confirmation from the new Subcontractor stating that they agree to work on the project along with the dollar value of the work to be performed.

Written approval of the substitution request shall be received by the Contractor, from the City or its authorized officer, prior to any unlisted Subcontractor (over 0.5% of the contract amount or \$10,000, whichever is greater) performing work on a project.

Substitution of Subcontractors without authorization shall subject the Contractor to those penalties set forth in Public Contract Code § 4110.

B. Supplier Substitution.

Requests shall be made in writing at least 10 days prior to the provision of materials, supplies or services by the proposed Supplier, and shall include proof of written notice to the originally listed Supplier of the proposed substitution.

Requests shall be made in writing to the Purchasing & Contracting Department, Attention Contracts Division, 1200 Third Avenue, Suite 200, San Diego, CA 92101 with a copy to the Engineer.

Substitution of Suppliers without authorization shall subject the Contractor to those penalties set forth in Public Contracts Code § 4110.

C. A Contractor whose Bid is accepted may not:

- (1) Substitute a person as Subcontractor or Supplier in place of the Subcontractor, Supplier listed in the original bid, except that the City, or it's duly authorized officer, may consent to the substitution of another person as a Subcontractor or Supplier in any of the following situations:
 - (a) When the Subcontractor or Supplier listed in the Bid after having a reasonable opportunity to do so fails or refuses to execute a written contract with the Contractor, when that written contract, based upon the Contract Documents or the terms of that Subcontractor's or Supplier's written bid is presented to the Subcontractor or Supplier by the Contractor.
 - (b) When the listed Subcontractor or Supplier becomes bankrupt or insolvent.
 - (c) When the listed Subcontractor or Supplier fails to perform its contract.
 - (d) When the listed subcontractor fails or refuses to meet bond requirements as set forth in Public Contract Code § 4108.
 - (e) When the Contractor demonstrates to the City or it's duly authorized officer, subject to the provisions set forth in Public Contract Code §

4107.5, that the name of the Subcontractor was listed as the result of an inadvertent clerical error.

- (f) When the listed Subcontractor is not licensed pursuant to the contractors license laws.
 - (g) When the listed Subcontractor is ineligible to work on a public works project pursuant to work on a public works project pursuant to §§ 1777.1 or 1777.7 of the Labor Code.
 - (h) When the City or its duly authorized agent determines that the listed Subcontractor is not a responsible contractor.
 - (i) When the City, or it's duly authorized officer, determines that the work performed by the listed Subcontractor or that the materials or supplies provided by the listed Supplier are substantially unsatisfactory and not in substantial accordance with the plans and specifications, or that the Subcontractor or Supplier is substantially delaying or disrupting the progress of the work.
- (2) Permit a contract to be voluntarily assigned or transferred or allow it to be performed by anyone other than the original Subcontractor, Supplier listed in the original bid without the consent of the City, or it's duly authorized officer.
 - (3) Other than in the performance of "Change Orders" causing changes or deviations from the Contract, sublet or subcontract any portion of the work, or contract for materials or supplies in excess of 0.5% of the Contractor's total bid or \$10,000, whichever is greater as to which his or her original bid did not designate a Subcontractor or Supplier.
- D. Following receipt of notice from the Contractor of the proposed substitution of a Subcontractor or Supplier, the listed Subcontractor or Supplier who has been so notified shall have 5 Working Days within which to submit written objections to the substitution to the Purchasing & Contracting Department, Attention Contracts Division, 1200 Third Avenue, Suite 200, San Diego, CA 92101 with a copy to the Engineer. Failure to file these written objections shall constitute the listed Subcontractor or Supplier's consent to the substitution. If written objections are filed, the City shall give notice in writing of at least 5 Working Days to the listed Subcontractor or Supplier of a hearing by the City on the Contractor's request for substitution.

VII. Prompt Payment. The Contractor or Subcontractor shall pay to any subcontractor, not later than 10 days of receipt of each progress payment, unless otherwise agreed to in writing; the respective amounts allowed the contractor on account of the work performed by the subcontractors, to the extent of each subcontractor's interest therein. In cases of subcontractor performance deficiencies, the Contractor shall make written notice of any withholding to the Subcontractor with a copy to the Engineer and the Purchasing & Contracting Department, Attention Contracts Division, 1200 Third Avenue, Suite 200, San Diego, CA 92101. Upon correction of the deficiency, the Contractor shall pay the Subcontractor the amount previously withheld within 14 days after payment by the City.

Any violation of California Business and Professions Code, § 7108.5 concerning prompt payment to Subcontractors shall subject the violating Contractor or Subcontractor to the penalties, sanction and other remedies of that section. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or Subcontractor in the event of a dispute involving late payment

or nonpayment by the Prime Contractor, deficient subcontract performance, or noncompliance by a subcontractor.

VIII. Prompt Payment of Funds Withheld To Subcontractors. The City will hold retention from the Contractor and will make prompt and regular incremental acceptances of portions, as determined by the Engineer, of the Work, and pay retention to the Contractor based on these acceptances. The Contractor or Subcontractor shall return all monies withheld in retention from a subcontractor within 30 days after receiving payment for Work satisfactorily completed and accepted including incremental acceptances of portions of the Work by the City. Federal law (49CFR26.29) requires that any delay or postponement of payment over 30 days may take place only for good cause and with the City's prior written approval. Any violation of this provision shall subject the violating the Contractor or Subcontractor to the penalties, sanctions and other remedies specified in § 7108.5 of the Business and Professions Code. These requirements shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or Subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor, deficient subcontract performance, or noncompliance by a subcontractor.

IX. Definitions. For purposes of reporting requirements for the *Subcontractors List*, the *Suppliers List*, and State and Federal funded projects, the following definitions apply:

Emerging Business Enterprise (EBE) means any for-profit enterprise that is not a broker, that is independently owned and operated; that is not a subsidiary of another business; and that is not dominant in its field of operation whose average gross annual receipts in the prior 3 fiscal years do not exceed:

- \$2.75 million - Construction
- \$1.5million - Specialty Construction
- \$1.5million - Goods/Materials/Services
- \$ 1.0 million - Trucking
- \$ 750,000 - Professional Services and Architect/Engineering

If a business has not existed for 3 years, the gross sales limits described above shall be applied based upon the annual averages over the course of the existence of the business. This definition is subsumed within the definition of Emerging Local Business Enterprises.

Emerging Local Business Enterprise (ELBE) means a Local Business Enterprise that is also an Emerging Business Enterprise.

Minority Business Enterprise (MBE) means a certified business which is at least 51% owned by African Americans, American Indians, Asians, Filipinos, Latinos, or combination and whose management and daily operation is controlled by one or more members of the identified ethnic groups. In the case of a publicly-owned business, at least 51% of the stock shall be owned by, and the business operated by, one or more members of the identified ethnic groups.

Women Business Enterprise (WBE) means a certified business which is at least 51% owned by one or more women and whose management and daily operation is controlled by the qualifying party(ies). In the case of a publicly-owned business, at least 51% of the stock shall be owned by, and the business operated by, one or more women.

Disadvantaged Business Enterprise (DBE) means a certified business which is at least 51% owned and operated by one or more socially and economically disadvantaged individuals and whose management and daily operation is controlled by the qualifying party(ies). In the case

of a publicly-owned business, at least 51% of the stock shall be owned by, and the business operated by, socially and economically disadvantaged individuals.

Disabled Veteran Business Enterprise (DVBE) means a certified business which is at least 51% owned and operated by one or more veterans with a service related disability and whose management and daily operation is controlled by the qualifying party(ies) The firm shall be certified by the State of California's Department of General Services, Office of Small and Minority Business.

Other Business Enterprise (OBE) means any business which does not otherwise qualify as Minority, Woman, Disadvantaged or Disabled Veteran Business Enterprise.

Small Business Enterprise (SBE) means any for-profit enterprise that is not a broker, that is independently owned and operated; that is not a subsidiary of another business; and that is not dominant in its field of operation whose average gross annual receipts in the prior three fiscal years do not exceed:

- \$5.0 million - Construction
- \$3.0 million - Specialty Construction
- \$3.0 million - Goods/Materials/Services
- \$2.0 million - Trucking
- \$1.5 million - Professional Services and Architect/Engineering

California State certified Micro and Disabled Veteran Owned business enterprises shall also satisfy the requirements to be defined as a Small Business Enterprise.

If a business has not existed for 3 years, the employment and gross sales limits described above shall be applied based upon the annual averages over the course of the existence of the business. This definition is subsumed within the definition of Small Local Business Enterprises.

Small Local Business Enterprise (SLBE) means a Local Business Enterprise that is also a Small Business Enterprise.

- X. Certification.** The City accepts certifications of MBE, WBE, DBE, or DVBE by any of the following methods:
- A. Current certification by the State of California Department of Transportation (CALTRANS) as MBE, WBE or DBE;
 - B. Current MBE or WBE certification from the California Public Utilities Commission. Additional information may be obtained from <http://www.cpuc.ca.gov/PUC/SupplierDiversity/CertInfo.htm>;
 - C. Current MBE certification from the San Diego Regional Minority Supplier Diversity Council. Additional information may be obtained from www.supplierdiversitysd.org;
 - D. DVBE certification is received from the State of California's Department of General Services, Office of Small and Minority Business (916) 322-5060 or go to their link at <http://www.pd.dgs.ca.gov/smbus/default.htm>.
 - E. Current certification by the City of Los Angeles as DBE, WBE or MBE. For more information go to http://bca.lacity.org/index.cfm?nxt_body=tutorials_c.cfm

- F. California State certified Micro and Disabled Veteran Owned business enterprises shall also satisfy the requirements to be defined as a Small Business Enterprise.

Subcontractors' valid proof of certification status e.g., copy of MBE, WBE, DBE, or DVBE certification shall be submitted as required.

XI. Contract Records and Reports. Contractors shall maintain the following records and reports required by the City of San Diego's Equal Opportunity Contracting Program:

- A. Records. The Contractor shall maintain records of all subcontracts entered into with all firms, all project invoices received from Subcontractors and Suppliers, all purchases of materials and services from Suppliers, and all joint venture participation. Records shall show name, telephone number including area code, and business address of each Subcontractor and Supplier, and joint venture partner, and the total amount actually paid to each firm.

Project relevant records, regardless of tier, may be periodically reviewed by the City.

- B. Reports. The Contractor shall submit to the City the following reports:

1. *Monthly Employment Report.* The *Monthly Employment Report (Form CC20)* shall list each individual employee working on the specific project by full name, social security number, gender, ethnic category, craft and employee source (i.e. union hall, apprenticeship program, other). Each *Monthly Employment Report* shall be submitted by the 5th day of the subsequent month to the Engineer with a copy to the EOC Program Manager at 1200 Third Avenue, Suite 200, San Diego, CA 92101.

The Contractor is responsible for collecting and submitting a *Monthly Employment Report* from all Subcontractors, at any level, working at the site.

2. *Monthly Invoicing Report.* The *Monthly Invoicing Report (Form CC25)* shall report payments made to all Subcontractors and Suppliers. Each *Monthly Invoicing Report* shall be submitted by the 5th day of the subsequent month to the Engineer with a copy to the EOC Program Manager at 1200 Third Avenue, Suite 200, San Diego, CA 92101. Incomplete reports may cause payment delays, non-payment of invoice, or both.
3. *Final Summary Report.* The records maintained under Paragraph A described above shall be consolidated into a *Final Summary Report (Form CC15)*, certified as correct by an authorized representative of the Contractor, and submitted to the Engineer with a copy to the EOC Program Manager at 1200 Third Avenue, Suite 200, San Diego, CA 92101, 30 days prior to completion. A *Notice of Completion and Acceptance* will not be filed by the City until after its review of the *Final Summary Report*.

**END OF CITY GENERAL EQUAL OPPORTUNITY CONTRACTING PROGRAM
REQUIREMENTS CONSTRUCTION CONTRACTOR REQUIREMENTS**

**EQUAL OPPORTUNITY CONTRACTING PROGRAM
SUBCONTRACTING REQUIREMENTS
(FOR CONTRACTS SUBJECT TO SLBE-ELBE ONLY)**

THESE SPECIAL PROVISIONS CONFORM TO THE POLICIES AND REQUIREMENTS ESTABLISHED BY THE CITY OF SAN DIEGO EQUAL OPPORTUNITY CONTRACTING PROGRAM SPECIFIED IN THE CITY'S GENERAL EOC REQUIREMENTS, EXCEPT FOR THE FOLLOWING:

**SMALL LOCAL BUSINESS ENTERPRISES ("SLBEs")
AND
EMERGING LOCAL BUSINESS ENTERPRISES ("ELBEs")**

See the Special Notice for SLBE-ELBE Program in the bid package for the specified mandatory and advisory subcontracting goals.

Program Summary: It is the City's policy to encourage greater availability, capacity development, and contract participation by SLBE firms in City contracts. This policy is, in part, intended to further the City's compelling interest to stimulate economic development through the support and empowerment of the local community, ensure that it is neither an active nor passive participant in marketplace discrimination, and promote equal opportunity for all segments of the contracting community.

The City is committed to maximizing subcontracting opportunities for all qualified and available firms.

This policy applies to City-funded construction contracts. Bidders shall be fully informed of this policy as set forth in these specifications. Mandatory goals, Bid Discounts and/or Restricted Competition are specified under the Special Notice for SLBE-ELBE Program.

SLBE-ELBE Subcontract Minimum Percentage: To be eligible for the award of this contract, the Bidder shall subcontract a minimum percentage of its Bid to qualified available SLBE-ELBE Subcontractors, as indicated in the Special Notice for SLBE-ELBE Program. The Bidder shall list all Subcontractors, regardless of amount. Failure to list subcontractors and subcontracting amounts with the Bid sufficient to meet or exceed the mandatory SLBE-ELBE participation level, SLBE-ELBE utilization documents and documentation demonstrating compliance with the affirmative steps (if participation levels are not achieved) will cause a Bid to be rejected as non-responsive.

Submit Good Faith Effort Documentation: If the Bidder has not attained the designated percentage goals, the Bidder shall demonstrate compliance with the affirmative steps as specified here and shall submit documentation showing that all required positive efforts were made prior to Bid opening (or in case of Design-Build contracts prior to the Construction NTP).

The required Good Faith Effort documentation shall be received at the following address **within 1 day of bid opening:**

Purchasing & Contracting Department
1200 Third Avenue, Suite 200
San Diego, CA 92101
SUBJECT: Good Faith Effort Documentation Bid No: _____

SLBE-ELBE PROGRAM REQUIREMENTS

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- I. General.** The Bidders shall make subcontracting opportunities available to a broad base of qualified Subcontractors and shall achieve the minimum SLBE-ELBE subcontractor participation identified for this project.

Failure to comply with the City's SLBE-ELBE Program will cause a Bid to be rejected as non-responsive.

At the City's sole discretion, these requirements may be waived in advance on projects deemed inappropriate for subcontracting participation.

- II. Subcontractor Participation.** SLBE-ELBE firms will be recognized as participants in the Contract according to the following criteria:

1. For credit to be allowed toward respective participation level, on the date Bids are opened, all listed SLBE-ELBE firms shall be certified as defined under Definitions and identified in Bid documents for and registered on the City's Contractor/Vendor Registration System.
2. The Subcontractor shall perform a commercially useful function for credit to be allowed toward subcontractor participation levels. The Subcontractor shall be required by the Contractor to be responsible for execution of a distinct element of the Work and shall carry out its responsibility by actually performing, managing, and supervising the Work.
3. If the Bidder is seeking the recognition of materials, supplies, or both obtained from Suppliers towards achieving any mandatory subcontracting participation goals, the Bidder shall submit with the Bid in Volume 2 showing the name, location i.e., city and the dollar amount of the Supplier.
4. The Bidder will be credited up to 60% of the amount to be paid to Suppliers for such materials/supplies unless Supplier manufactures or substantially alters materials/supplies in which case 100% will be credited.

- III. Mandatory SLBE-ELBE Subcontractor Participation Goal.** Unless specified otherwise, the City has incorporated a mandatory SLBE-ELBE subcontractor participation goal to enhance competition and maximize subcontracting opportunities.

IV. Public Works Contracts.

1. Contracts valued at \$1,000,000 and above include a mandatory subcontractor participation requirement for SLBE-ELBE firms.

- a) The Bidder shall achieve the mandatory subcontractor participation requirement or demonstrate good faith efforts.
 - b) The Bidders shall submit, at the time of Bid submittal, on the appropriate form, the name of all SLBE-ELBE Subcontractors and both the percentage of subcontracting and the items of Work to be performed by the SLBE or ELBE Subcontractors.
 - c) An SLBE-ELBE Bidder may count its own participation toward achieving the mandatory goal as long as the SLBE-ELBE Bidder performs 51% of the Contract Price.
2. Contracts Valued over \$500,000 and under \$1,000,000 shall include the mandatory subcontractor participation requirement described above and the following:
- a) 5% bid discount for SLBE-ELBE firms.
 - b) A bid discount based on the amount of SLBE-ELBE utilization by a non SLBE-ELBE up to a maximum of 5%.
 - c) Bid discounts shall not apply if the award to the SLBE-ELBE will result in a total contract cost of \$50,000 in excess of the apparent lowest Bid.
 - d) In the event of a tie bid between a discounted Bidder and a non-discounted Bidder, the discounted Bidder will be awarded the Contract.
3. Minor Public Works Projects - Contracts valued over \$250,000 up to \$500,000 will be considered Minor Construction Projects and will be awarded through a competitive bid process open only to City certified SLBE-ELBE firms. If no responsible Bids received, the Contract will be made available to all Bidders and subject to requirements listed in “Major Public Works Projects” sections above.

Contracts valued at \$250,000 and below will also be considered Minor Construction Projects and will be awarded through a competitive bid process open only to City certified ELBEs unless there are less than 2 firms available at which it will be awarded through a competitive process open only to the City certified SLBE-ELBE firms. If no responsible Bids are received, the Contract will be made available to all Bidders and subject to requirements listed in Major Public Works Projects above.

V. Joint Ventures. The City may allow for Joint Venture bid discounts on some contracts. Contracts that allow for Joint Venture bid discounts will be designated in Bid documents. A firm that is bidding or competing for City contracts may partner with a certified SLBE or ELBE to compete for contracts as a Joint Venture.

A Joint Venture shall be between two entities with the same discipline or license as required by the City. Joint ventures will receive bid discounts depending on the SLBE or ELBE percentage of participation. To be eligible for a discount, a Joint Venture Agreement shall be approved by the City’s EOCP Manager at the time of Bid submittal. The maximum allowable discount shall be 5%. The parties shall agree to enter in the relationship for at least the life of the projects.

1. Joint Venture shall submit a Joint Venture Management Plan, a Joint Venture Agreement, or both at least 2 weeks prior to the Bid due date. Copies of the Joint Venture applications are available upon request to the EOCP Manager. Each agreement or management plan shall include the following:
 - a) Detailed explanation of the financial contribution for each partner;
 - b) List of personnel and equipment used by each partner;
 - c) Detailed breakdown of the responsibilities of each partner;
 - d) Explanation of how the profits and losses will be distributed;
 - e) Description of the bonding capacity of each partner; and

- f) Management or incentive fees available for any one of the partners (if any).
- 2. Commercially Useful Functions Performed by Joint Venture Partners – Each Joint Venture partner shall perform a “commercially useful function” as the term is defined herein. An SLBE or ELBE that relies on the resources and personnel of a non-SLBE or ELBE firm will not be deemed to perform a “commercially useful function”.
- 3. License Requirements – Each Joint Venture partner shall possess licenses appropriate for the discipline for which a proposal is being submitted. If a Joint Venture is bidding on a single trade project, at the time of bid submittal, each Joint Venture partner shall possess the requisite specialty license for that trade bid.
- 4. Delineation of Work – The SLBE or ELBE partner shall clearly define the portion of the Work to be performed. This work shall be of the similar type of work the SLBE or ELBE partner performs in the normal course of its business. The Joint Venture Participation Form shall specify the Bid items to be performed by each individual Joint Venture partner. Lump sum Joint Venture participation shall not be acceptable.
- 5. Responsibilities of the SLBE or ELBE Joint Venture Partner:
 - a) The SLBE or ELBE partner shall share in the control, management responsibilities, risks and profits of the Joint Venture in proportion with the level of participation in the project.
 - b) The SLBE or ELBE partner shall perform work that is commensurate with its experience.
 - c) The SLBE or ELBE partner shall use its own employees and equipment to perform its portion of the Work.
 - d) The Joint Venture as a whole shall perform Bid items that equal or exceed 25% of the Contract Price, excluding the cost of manufactured items, in order to be eligible for a Joint Venture discount.

VI. Subcontracting Goals. The Bidders are encouraged to take positive steps to diversify and expand their subcontractor solicitation base and to offer contracting opportunities to all eligible ELBE and SLBE certified Subcontractors. The Bidder is required to meet the Project specific goals as outlined in the Specifications or satisfy good faith documentation requirements.

VII. Maintaining Participation Levels:

- 1. Credit and preference points are earned based on the level of participation proposed prior to the award of the Contract. Once the Project begins the Contractor shall achieve and maintain the SLBE-ELBE participation levels for which credit and preference points were earned. The Contractor shall maintain the SLBE-ELBE percentages indicated at the Award of Contract and throughout the Contract Time.
- 2. If the City modifies the original scope of Work, the Contractor shall make reasonable efforts to maintain the SLBE-ELBE participation for which creditor preference points were earned. If participation levels shall be reduced, approval shall be received from the EOCP Manager prior to making changes.
- 3. The Contractor shall notify and obtain written approval from the EOCP Manager in advance of any reduction in subcontract scope, termination, or substitution for a designated SLBE-ELBE subcontractor. Failure to do so shall constitute a material breach of the Contract.
- 4. If the Contractor fails to maintain the SLBE-ELBE participation listed at the time the contract is awarded, and has not received prior approval from the EOCP Manager, the City may seek

any and all remedies available under law, which may include contract suspension, termination, debarment, or both upon approval by the Mayor or designee.

5. Submission of Final Summary Report – The Contractor shall submit a Final Summary Report including all subcontracting activities to the City within 15 days after the Work has been accepted. Failure to comply may result in assessment of liquidated damages or withholding of retention. Within 10 Working Days of submission, EOCP will review and verify 100% of subcontract participation reported in the Final Summary Reports prior to approval and release of final retainage to the Contractor. In the event such withheld retainage includes sums that are due to Subcontractors for successfully completed work, EOCP may authorize direct payment by the City of that portion of the withheld retainage directly to the Subcontractors.

VIII. Subcontracting Efforts Review and Evaluation. Documentation of Bidder’s subcontracting efforts will be reviewed by EOCP to verify that the Bidder made subcontracting opportunities available to a broad base of qualified subcontractors, negotiated in good faith with interested subcontractors, and did not reject any bid for unlawful discriminatory reasons. The EOCP review is based on the federal “Six Good Faith Efforts” model.

1. What is the Purpose of the Six Good Faith Efforts?

The Good Faith Efforts are required methods to ensure that all ELBE and SLBE firms have the opportunity to compete for the City’s Public Works procurements.

2. What are the Six Good Faith Efforts?

The Six Good Faith Efforts also known as affirmative steps represent good faith efforts to attract and utilize ELBE and SLBE firms:

- a) Ensure ELBE firms are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities.
- b) Make information of forthcoming opportunities available to SLBE-ELBE firms and arrange time for contracts and establish delivery schedules, where requirements permit, in a way that encourages and facilitates participation by SLBE-ELBE firms in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 15 days before the Bid or Proposal closing date.
- c) Consider in the contracting process whether firms competing for large contracts could subcontract with SLBE-ELBE firms.
- d) Encourage contracting with a consortium of ELBE-SLBE firms when a contract is too large for one of these firms to handle individually.
- e) Use the services and assistance of the City’s EOC Office and the SLBE-ELBE Directory.
- f) If the Contractor awards subcontracts, it shall require the Subcontractors to take the steps in subparagraphs (a)-(e) of this subsection.

3. What is the good faith effort documentation?

If the stated SLBE-ELBE goals are not met, the Bidder shall submit, within 1 day of the Bid opening, information necessary to establish adequate good faith efforts were taken to meet the contract goal. The required documentation includes:

- a) The names and dates of each publication in which a request for SLBE-ELBE participation for this project was placed by the Bidder.

- b) The names and dates of written notices sent to certified SLBE-ELBE firms soliciting bids for this project and the dates and methods used for following up initial solicitations to determine with certainty whether the SLBE-ELBE firms were interested.
- c) The items of work which the Bidder made available to SLBE-ELBE firms, including, where appropriate, any breaking down of the contract work items (including those items normally performed by the Bidder with its own forces) into economically feasible units to facilitate SLBE-ELBE participation. It is the Bidder's responsibility to demonstrate that sufficient work to meet the SLBE-ELBE goal was made available to SLBE-ELBE firms.
- d) The names, address and phone numbers of rejected SLBE-ELBE firms, the firms selected for that work, and the reasons for the Bidder's choice.
- e) Efforts made to assist interested SLBE-ELBE firms in obtaining bonding, lines of credit or insurance, and any work which was provided to the SLBE-ELBE firms.
- f) Efforts made to assist interested SLBE-ELBE firms in obtaining necessary equipment, supplies, materials, or related assistance or services, excluding supplies and equipment the SLBE-ELBE subcontractor purchases or leases from the prime contractor or its affiliate.
- g) The names of agencies contacted to provide assistance in contracting, recruiting and using SLBE-ELBE firms, and evidence that the Contractor utilized the City's approved list of SLBE-ELBE firms.
- h) Any additional data to support a demonstration of "good faith efforts."

4. What is the required SLBE-ELBE subcontracting documentation?

The Bidder shall submit the SLBE-ELBE subcontracting documentation as part of its Bid. For Design-Build contracts the information may be submitted prior to Construction NTP. For Design-Build contracts, no Construction NTP will be issued unless the Contractor has complied with these specifications.

The required documentation includes:

- a) the names and addresses of ELBE-SLBE firms that will participate in the Contract;
- b) description of the work that each ELBE-SLBE firm will perform;
- c) the dollar amount of the participation of each ELBE-SLBE firm participating;
- d) written documentation of the Bidder's commitment to use each ELBE-SLBE business enterprise, and labor surplus area subcontractor whose participation it submits to meet the contract goal; and
- e) written confirmation from the SLBE-ELBE firm that it is participating in the Contract as provided in the commitment made in these specifications.

Failure to comply with these specifications will lead to the Bid being declared non-responsive and, therefore, may be rejected.

The Contractor shall maintain the records documenting compliance with requirements including documentation of its good faith efforts and data relied upon in formulating its fair share objectives.

IX. Subcontractor Substitution. Evidence of fraud or discrimination in substitution of subcontractors will result in sanctions including assessment of penalty fines, termination of contract or debarment. This section does not replace applicable California Public Contract Code.

X. Falsification of Sub-Agreement and Fraud. Falsification or misrepresentation of a sub-agreement as to company name, contract amount and/or actual work performed by Subcontractor, or any falsification or fraud on the part of Bidders in the submission of documentation and forms pursuant to this program, will result in sanctions against the Bidder including assessment of penalty fines, termination of the Contract, or debarment. Instances of falsification or fraud which are indicative of an attempt by Bidders to avoid subcontracting with certain categories of subcontractors on the basis of race, gender, religion, national origin, ethnicity, sexual orientation, age, or disability, shall be referred to the Equal Opportunity Contracting Program's Investigative Unit for possible violations of Article 2, Division 35 of the City Administrative Code, §§ 22.3501 et seq. (Nondiscrimination in Contracting).

XI. Suppliers. The Contractors seeking the recognition of materials and/or supplies obtained from Suppliers towards achieving any mandatory subcontracting goals shall submit with their Bids the name, location (City), and the dollar amount of the Suppliers on the City provided form.

The Contractors will be credited up to 60% of the amount to be paid to the Suppliers for such materials/supplies unless Supplier manufactures or substantially alters materials/supplies in which case 100% will be credited.

For the purpose of achieving the Mandatory Subcontractor Participation level (percentage), Field Orders, Additive or Deductive, and Allowance Bid Items will not be included in the calculation.

XII. Definitions. The following definitions shall be used in conjunction with these specifications:

Bid Incentives – Additional inducements or enhancements in the bidding process that are designed to increase the chances for the selection of SLBE firms in competition with other firms. These bid incentives may be applied to all solicitations, contracts, and letter agreements for Architecture and Engineering services, Construction, Goods & Services, and Professional services including change orders and amendments.

Broker - An individual or firm employed by others to plan and organize sales or negotiate contracts for a commission.

Commercially Useful Function – An SLBE-ELBE performs a commercially useful function when it is responsible for execution of the Work and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the SLBE-ELBE shall also be responsible, with respect to materials and supplies used on the Contract, for negotiating price, determining quantity and quality, ordering the material, and installing (where applicable) and paying for the material itself.

To determine whether an SLBE-ELBE is performing a commercially useful function, an evaluation shall be performed of the amount of work subcontracted, normal industry practices, whether the amount the SLBE-ELBE firm is to be paid under the contract is commensurate with the Work it is actually performing and the SLBE-ELBE credit claimed for its performance of the Work, and other relevant factors. Specifically, an SLBE-ELBE does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of meaningful and useful SLBE-ELBE participation, when in similar transactions in which SLBE-ELBE firms do not participate, there is no such role performed.

Emerging Business Enterprise (“EBE”) - Any for-profit enterprise that is not a broker, that is independently owned and operated; that is not a subsidiary of another business; that meets the definition of a local business; and that is not dominant in its field of operation whose average gross annual receipts in the prior three fiscal years do not exceed:

- \$2.75 million - Construction
- \$1.5million - Specialty Construction

- \$1.5million – Goods/Materials/Services
- \$ 1.0 million – Trucking
- \$ 750,000 – Professional Services and Architect/Engineering

If a business has not existed for 3 years, the gross sales limits described above shall be applied based upon the annual averages over the course of the existence of the business.

Equal Opportunity Contracting Program (EOCP) Manager - The City employee responsible for the oversight, tracking, monitoring, administration, and implementation of the SLBE program, ensuring that compliance with contract participation requirements is maintained, and overall program goals and objectives are met

Goal – A non-mandatory annual aspirational percentage goal for SLBE-ELBE contract participation is established annually for Architecture and Engineering, Construction, Goods & Services and Professional services. Mandatory percentage goals for SLBE-ELBE subcontract participation may be established on a contract-by-contract basis.

Good Faith Efforts – Documentation of the Bidder’s intent to comply with SLBE Program goals and procedures, including, but not limited to the following:

(1) documentation within a bid submission or proposal reflecting the Bidder’s commitment to comply with SLBE Program goals as established for a particular contract on the required forms; or (2) documentation of efforts made towards achieving the Program goals (e.g., timely advertisements in appropriate trade publications and publications of wide general circulation; timely posting of subcontract opportunities on the City web site; solicitations of bids from all qualified SLBE-ELBE firms listed in Equal Opportunity Contracting Program’s SLBE-ELBE Directory of certified SLBE-ELBE firms; correspondence from qualified SLBE-ELBE firms documenting their unavailability to perform SLBE-ELBE contracts; documentation of efforts to subdivide work into smaller quantities for subcontracting purposes to SLBE-ELBE firms; documentation of efforts to assist SLBE-ELBE firms with obtaining financing, bonding, or insurance required by the Bidder; and documentation of consultations with trade associations and consultants that represent the interests of small and local businesses in order to identify qualified and available SLBE-ELBE subcontractors.)

Independently Owned, Managed, and Operated – Ownership of a SLBE-ELBE firm shall be direct, independent, and by individuals only. Business firms that are owned by other businesses or by the principals or owners of other businesses that cannot themselves qualify under the SLBE-ELBE eligibility requirements shall not be eligible to participate in the Program. Moreover, the day-to-day management of the SLBE-ELBE firm shall be direct and independent of the influence of any other businesses that cannot themselves qualify under the SLBE-ELBE eligibility requirements.

Industry Categories – Procurement groupings for City contracts for purposes of the administration of the programmatic elements shall be inclusive of architecture and engineering, construction, professional services, and goods and services procurement (manufacturing, wholesale and retail, and non-professional services). Industry Categories may also be referred to as “business categories.”

Joint Venture - An association of two or more persons or businesses carrying out a single business enterprise for which purpose they combine their capital, efforts, skills, knowledge and/or property. Joint ventures shall be established by written agreement.

Local Business Enterprise (“LBE”) - A firm having a Principal Place of Business and a Significant Employment Presence in San Diego City or County, California that has been in operation for 12 consecutive months and a valid business tax certificate. This definition is subsumed within the definition of Small Local Business Enterprise.

Minor Construction Program – A program developed for bidding exclusively among SLBE-ELBE Construction firms.

Minor Consultant/Services Program – A program developed for bidding exclusively among SLBE-ELBE Consultant/Service firms.

Points – The quantitative assignment of value for specific evaluation criteria in the selection process.

Principal Place of Business – A location wherein a firm maintains a physical office and through which it obtains no less than 50% of its overall customers or sales dollars.

Protégé – A firm that has been approved, is an active participant in the City’s Mentor-Protégé Program, has signed the required program participation agreement and has been assigned a mentor.

Public Works Contract – A contract for the construction, reconstruction or repair of public buildings, streets, utilities and other public works.

Responsible - a Bidder’s quality, fitness and capacity to perform the particular requirements of the proposed work.

Responsiveness - a Bidder’s compliance with the bidding instructions.

Significant Employee Presence – No less than 25% of a firm’s total number of employees are domiciled in either the City and/or San Diego County.

SLBE-ELBE Plan Execution Certification (EOCP Form AA60) - The form certifying the general contractor’s intent to use a SLBE-ELBE subcontractor, verifying that an agreement has been executed between the prime and the SLBE-ELBE.

SLBE-ELBE Directory - A listing of the small and emerging local businesses that have been certified by the EOCP for participation in the SLBE Program.

SLBE-ELBE Certification/Re-certification Application (EOCP Form R) – This form shall be completed by SLBE-ELBE firms when applying for and/or recertifying SLBE-ELBE status for participation in the City’s SLBE Program. This form shall be completed every 2 years by certified SLBE-ELBE firms by the anniversary date of their original certification.

SLBE-ELBE Schedule for Subcontractor Participation (EOCP Form AA65) – This form shall be completed by all non-SLBE firms that subcontract to SLBE firms. A form shall be submitted for each SLBE-ELBE subcontractor. This form(s) shall be reviewed and approved by the Director of EOCP before contract award.

Small Local Business Enterprise (“SBE”) - Any for-profit enterprise that is not a broker, that is independently owned and operated; that is not a subsidiary of another business; that meets definition of a local business; and that is not dominant in its field of operation whose average gross annual receipts in the prior three fiscal years do not exceed:

- \$5.0 million - Construction
- \$3.0 million - Specialty Construction
- \$3.0 million - Goods, Materials, and Services
- \$2.0 million - Trucking
- \$1.5 million - Professional, Architect, and Engineering Services

California State certified Micro and Disabled Veteran Owned business enterprises shall also satisfy the requirements to be defined as a Small Business Enterprise.

If a business has not existed for 3 years, the employment and gross sales limits described above shall be applied based upon the annual averages over the course of the existence of the business.

Spend Dollars – Dollars actually paid to the Contractor and/or Subcontractors and Suppliers for City contracted goods and/or services.

Vendor Registration System - A web-based software application used by the City to track and monitor subcontractor availability and utilization on City contracts.

XIII. Forms. The following forms shall be submitted with the Bid:

- a) SLBE-ELBE Plan Execution Certification (EOCP Form AA60)
- b) SLBE-ELBE Schedule for Subcontractor Participation (EOCP Form AA65)

END OF SLBE-ELBE EQUAL OPPORTUNITY CONTRACTING PROGRAM
SUBCONTRACTING REQUIREMENTS

**EQUAL OPPORTUNITY CONTRACTING PROGRAM
SUBCONTRACTING OUTREACH PROGRAM REQUIREMENTS
(FOR CONTRACTS SUBJECT TO SCOPE ONLY)**

THESE SPECIAL PROVISIONS CONFORM TO THE POLICIES AND REQUIREMENTS ESTABLISHED BY THE CITY OF SAN DIEGO EQUAL OPPORTUNITY CONTRACTING PROGRAM SPECIFIED IN THE CITY'S GENERAL EOC REQUIREMENTS, EXCEPT FOR THE FOLLOWING.

Program Summary:

The Subcontracting Outreach Program (SCOPE) applies to City-funded construction contracts in excess of \$100,000.

The City of San Diego is committed to maximizing subcontracting opportunities for all qualified and available firms. Bidders shall be fully informed of the Subcontracting Outreach Program as set forth in these specifications.

See the Special Notice for Subcontracting Outreach Program in the bid package for the specified mandatory and advisory subcontracting goals.

Subcontract Minimum Percentage:

To be eligible for award of this project, the Bidder shall subcontract a minimum percentage of its Bid to qualified available subcontractors, as indicated the Special Notice for Subcontracting Outreach Program. The Bidder shall list all Subcontractors, regardless of amount. Failure to list subcontractors and subcontracting amounts with the Bid sufficient to meet or exceed the mandatory subcontracting participation level will cause a Bid to be rejected as non-responsive.

Submit Outreach Documentation:

To be eligible for award of this project, the 5 apparent low Bidders shall submit documentation of their subcontractor outreach effort with the Bid or provide this documentation within 3 Working Days following the close of business on the day Bids are opened. Failure to submit required documentation within this time frame will cause the Bid to be rejected as non-responsive. The City may request additional information to validate or clarify; such information shall be submitted promptly upon request.

Mail a copy of subcontractor outreach documentation to:

CITY OF SAN DIEGO
PURCHASING & CONTRACTING DEPARTMENT
1200 THIRD AVENUE, SUITE 200, MS 56P
SAN DIEGO, CA 92101
ATTN: CONTRACT SPECIALIST
SUBJECT: OUTREACH DOCUMENTATION Bid No: _____

For assistance or further information about the Subcontracting Outreach Program, contact the Equal Opportunity Contracting Program at (619) 236-7161.

SUBCONTRACTING OUTREACH PROGRAM (SCOPE) CONTENTS

- I. General
- II. Subcontractor Outreach Program
- III. Mandatory Subcontractor Participation Goal
- IV. Advisory Participation Levels
- V. Subcontractor Outreach Efforts Review and Evaluation
- VI. Contract Award
- VII. Subcontractor Substitution
- VIII. Falsification of Sub-Agreement and Fraud
- IX. Submission of Final Summary Report
- X. Suppliers

I. General

The City is committed to ensuring full and equitable participation by subcontracting businesses in provision of construction supplies and services on a contractual basis. Bidders are advised to be fully informed of the *Subcontracting Outreach Program* as set forth in these specifications. Failure to comply with the City's *Subcontracting Outreach Program* will cause a Bid to be rejected as non-responsive.

It is the policy of the City of San Diego to provide all subcontractors an equal opportunity to participate in performance of City contracts. Bidders assist the City in implementing this policy by taking reasonable steps to ensure all qualified businesses, including DBEs, DVBES, MBEs, WBEs, and Other OBEs, have equal opportunity to compete for and participate in the City contracts.

At the City's sole discretion, these requirements may be waived in advance on projects deemed inappropriate for subcontracting participation.

II. Subcontractor Outreach and Participation

The Bidders shall make subcontracting opportunities available to a broad base of qualified Subcontractors and shall achieve the minimum subcontractor participation identified for this project.

DBEs, DVBES, MBEs, WBEs, and OBEs will be recognized as participants in a contract according to the following criteria:

1. For credit to be allowed toward respective participation level, on the date bids for the project are opened, all listed DBE and DVBE subcontractors shall be certified as defined under Paragraph III, Definitions, Items A and B, and identified in bid documents for data collection purposes, and all MBE, WBE, and OBE subcontractors shall be registered on the City's Contractor / Vendor Registration System.
2. A Subcontractor shall perform a commercially useful function for credit to be allowed toward subcontractor participation levels. A Subcontractor shall be responsible for execution of a distinct element of the Work and shall carry out its responsibility by actually performing, managing and supervising the Work.
3. The Contractors seeking the recognition of materials and supplies obtained from Named Equipment/Material Supplier List towards achieving any mandatory subcontracting participation goals shall submit with their Bids on Volume 2. On Volume 2, at a minimum, should have the name, location (city) and the dollar amount of the Named Equipment/Material Supplier List.

4. Contractors will be credited up to 60% of the amount to be paid to the Suppliers for such materials and supplies unless vendor manufactures or substantially alters materials and supplies in which case 100% will be credited.

III. Mandatory Subcontractor Participation Goal

The City has incorporated a mandatory subcontractor participation goal to enhance competition and maximize subcontracting opportunities. Failure on the part of a bidder to represent in its Bid that it will subcontract, at a minimum, a percentage of the overall dollar value of its Bid that is equal to the Mandatory Subcontractor Participation Goal established for this contract will render that Bid as non-responsive.

IV. Advisory Participation Levels

The City has identified the relevant commodity or industry codes that are applicable to the Work. Based on current availability data for those relevant commodity or industry codes derived from the City's automated Contractor/Vendor Registration System, the City advises that the advisory levels of subcontract participation should be attainable for DBEs, DVBEs, MBEs, WBEs, and OBEs on this contract.

The DBE, DVBE, MBE, WBE, and OBE participation levels are advisory only, and do not constitute a basis for determination of non-compliance or disqualification.

V. Subcontractor Outreach Efforts Review and Evaluation

Documentation of a bidder's outreach efforts will be reviewed by EOCP according to the indicators listed below to verify that bidder made subcontracting opportunities available to a broad base of qualified subcontractors, negotiated in good faith with interested subcontractors, and did not reject any bid for unlawful discriminatory reasons.

Failure to achieve a minimum of 80 out of 100 points will render a Bid non-responsive and will result in its rejection. Indicator points are awarded on a pass or fail basis, i.e., either full or zero points can be achieved for compliance with each item as set forth below:

	Indicator	Points
1.	Achievement of advisory DBE/DVBE/MBE/WBE/OBE subcontractor participation levels	No Points
2.	Pre-Bid Meeting attendance	5 Points
3.	Identification of sufficient subcontracting work	10 Points
4.	Broad-based advertisement	10 Points
5.	Written notice to subcontractors	10 Points
6.	Follow-up to initial solicitations	10 Points
7.	Provision of plans, specifications and requirements	10 Points
8.	Request for assistance from recruitment and placement agencies	10 Points
9.	Documentation of subcontractor negotiation	25 Points
10.	Assistance with bonds, credit lines and insurance	10 Points
	POSSIBLE TOTAL	100 Points

1.	Achievement of advisory DBE/DVBE/MBE/WBE/OBE subcontractor participation levels	No Points
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Failure to meet advisory DBE/DVBE/MBE/WBE/OBE subcontractor participation levels is not a basis for disqualification or determination of non-compliance with this policy.

2.	Pre-bid meeting attendance	5 Points
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Bidder attended pre-bid meeting scheduled by the City to inform all Bidders of requirements for subject project. If Bidder certifies in writing prior to pre-bid meeting that it was already informed of project requirements, the City may waive requirement for pre-bid meeting attendance.

Required documentation: a) Attend pre-bid meeting and be listed on attendance sheet; or b) Submit letter requesting waiver prior to pre-bid meeting.

3.	Identification of sufficient subcontracting work	10 Points
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Bidder identified and selected specific work items in subject project to be performed by sub-bidders. Bidder subdivided total contract work requirements into smaller portions or quantities to permit maximum active participation.

Required documentation: Content of advertisements (see Indicator 4) and written notices to subcontractors (see Indicator 5) will demonstrate compliance with this objective; alternatively, a copy of the posting of bidder's advertisement of subcontract opportunities on City website page that contains a link to the City's contract bid document will also demonstrate compliance with this objective.

4.	Broad-based advertisement	10 Points
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Not less than 10 days prior to bid submittal, Bidder conducted an advertising campaign designed to reach all segments of the San Diego community by advertising in either the City website, newspapers, trade association publications, special interest publications, trade journals, community papers or other media. Advertisement requesting bids from subcontractors shall be specific, about the project and the types of subcontract work being solicited, and may not be a generic plan holder advertisement provided by the publication. Advertisement shall identify phone number, e-mail, and mailing address for the Bidder, shall be worded to ensure it does not exclude or limit number of potential respondents.

Required documentation: Submit copies of advertisements and proof of publication dates; in the case of broad-based advertisements posted on the City website page for a particular Bid, provide a print out form at least 10 days in advance of Bid opening of the web pages that reflects the Bid document link and the Bidder's subcontractor advertisement for that Bid. In the alternative, the Bidder may submit a completed form certifying that its broad-based advertisement for that specific bid was posted on the City website at least ten days in advance of Bid opening, that the City has represented that it would send targeted e-mail alerts to all such subcontractors that have registered with the City's Contractor / Vendor Registration System under the commodity / industry codes that are applicable to that contract, and that those e-mail alerts contain links to the City website page where the Bidder's advertisement is posted.

5.	Written notice to subcontractors	10 Points
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Not less than 10 days prior to Bid submittal, the Bidder provided written notice of its interest in receiving sub-bids on subject contract to business enterprises with an interest in performance of identified work items. Contents of letters or notices shall include:

- City of San Diego's project name;
- Name of Bidder;
- Areas of work available for subcontracting;
- Contact person's name and phone number;
- Information on availability of plans and specifications; and
- Bidder's policy concerning assistance to subcontractors in obtaining bonds, credit lines and/or insurance.

Required documentation: Submit copy of each letter or notice sent to subcontractors for each item of work to be performed. If only one master notification, submit letter or notice with list of recipients. Faxed copies shall include fax transmittal confirmation slip showing date and time of transmission. Mailed letters shall include copies of metered envelopes or certified mail receipts. Alternatively, the Bidder may provide either a print out copy from at least 10 days in advance of Bid opening of the web pages that reflect the bid document link and the Bidder's broad-based subcontractor advertisement for that bid (see Indicator 4). Or the Bidder may submit a completed form certifying that its broad-based advertisement for that specific bid was posted on the City website at least 10 days in advance of bid opening, that the City has represented that it would send targeted e-mail alerts to all such subcontractors that have registered with the City's Contractor / Vendor Registration System under the commodity / industry codes that are applicable to that contract, and that those e-mail alerts contain links to the City website page where the bidder's advertisement is posted.

6.	Follow-up to initial solicitations	10 Points
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Bidder followed up initial solicitations of written notice to subcontractors to determine interest in specific portions of project work, answered questions, recorded phone quotes, and recorded subcontractor's interest in bidding on any portion of subject project.

Required documentation: Submit copy of telephone logs including name of caller, name of company called, phone number, contact person, time, date and result of conversation. Telephone logs shall be submitted to demonstrate follow-up with all contractors to whom written notices were sent.

7.	Provision of plans, specifications and requirements	10 Points
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Bidder provided interested sub-bidders with access to plans, specifications and requirements for subject project.

Required documentation: Content of advertisements (Indicator 4) or written notices to subcontractors (Indicator 5) will demonstrate compliance with this indicator.

8.	Request for assistance from recruitment/placement agencies	10 Points
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Not less than 15 days prior to Bid submittal, bidder requested assistance from agencies which recruit and place subcontractors. A list of such agencies is available from office of EOCP. Other organizations which promote subcontractor activities may also be contacted.

Required documentation: Submit copy of each letter sent to outreach agencies requesting assistance in recruiting subcontractors. Faxed copies shall include fax transmittal confirmation slip showing date and time of transmission. Mailed letters shall include copies of metered

envelopes or certified mail receipts. Content of letters shall include City of San Diego's project name, name of bidder, and contact person's name and phone number.

9.	Documentation of subcontractor negotiation	25 Points
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Bidder acted in good faith with interested subcontractors and has rejected no bid for other than legitimate business reasons.

Required documentation: Submit: a) Copies of all Subcontractor Bids or quotes received; and b) Summary sheet organized by work type listing subcontractor company names with bid amounts for each work type. Identify selected subcontractor for each work type. If bidder elects to use own forces to perform a work type, include Bid to show own costs for the work. Copies of Bids or quotes from all vendors and suppliers shall also be included.

10.	Assistance with bonds, credit lines and insurance	10 Points
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Bidder made efforts to advise and assist interested subcontractors in obtaining bonds, credit lines and insurance required for subject project.

Required documentation: Content of advertisements (Indicator 4) or written notices to subcontractors (Indicator 5) will determine compliance with this objective.

VI. Contract Award

The City reserves the right to reject any and all Bids. Award of contract will be to the Apparent Low Bidder whose proposal also complies with the *Subcontracting Outreach Program* as determined by evaluation of submitted documentation.

VII. Subcontractor Substitution

Post contract award, the City will exercise its discretion to determine whether the circumstances surrounding a change in the subcontract scope, a change in the size of a subcontract, or the timing of a subcontractor substitution, reasonably require new outreach efforts and documentation to be submitted on the part of the Contractor prior to the selection of a substitute subcontractor.

Evidence of fraud or discrimination in substitution of subcontractors will result in sanctions including assessment of penalty fines, termination of contract or debarment. This section does not replace applicable California Public Contract Code.

VIII. Falsification of Sub-Agreement and Fraud

Falsification or misrepresentation of a sub-agreement as to company name, contract amount and/or actual work performed by Subcontractor, or any falsification or fraud on the part of Bidders in the submission of documentation and forms pursuant to this program, will result in sanctions against the Bidder including assessment of penalty fines, termination of the Contract, or debarment. Instances of falsification or fraud which are indicative of an attempt by Bidders to avoid subcontracting with certain categories of subcontractors on the basis of race, gender, religion, national origin, ethnicity, sexual orientation, age, or disability, shall be referred to the Equal Opportunity Contracting Program's Investigative Unit for possible violations of Article 2, Division 35 of the City Administrative Code, §§ 22.3501 et seq. (Nondiscrimination in Contracting).

IX. Submission of Final Summary Report

Contractor shall submit a *Final Summary Report (Form CC15)* including all subcontracting activity during the project to the City within 15 days after Final Completion. Failure to comply may result in assessment of liquidated damages or withholding of retention. Within 10 Business Days of submission, the office of EOCP will review and verify 100% of subcontract

participation reported in the Final Summary Reports required under this section prior to approval and release of final retainage to the Contractor. In the event such withheld retainage includes sums that are due to subcontractors for successfully completed work, the office of EOCP may authorize direct payment by the City of that portion of the withheld retainage directly to the subcontractors.

XI. Suppliers

The Contractors seeking the recognition of materials and/or supplies obtained from Suppliers towards achieving any mandatory subcontracting goals shall submit with their Bids the name, location (City), and the dollar amount of the Suppliers on the City provided form.

The Contractors will be credited up to 60% of the amount to be paid to the Suppliers for such materials/supplies unless Supplier manufactures or substantially alters materials/supplies in which case 100% will be credited.

For the purpose of achieving the Mandatory Subcontractor Participation level (percentage), Field Orders, Additive or Deductive, and Allowance Bid Items will not be included in the calculation.

END OF OPPORTUNITY CONTRACTING PROGRAM (SCOPE) SUBCONTRACTING
REQUIREMENTS

(((((((((((((END OF CITY'S EOCP REQUIREMENTS))))))))))))

CITY SUPPLEMENT

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PART 1

GENERAL PROVISIONS

SECTION 1 – TERMS, DEFINITIONS, ABBREVIATIONS, UNITS OF MEASURE AND SYMBOLS

1-1 GENERAL. ADD the following:

The word "provide" shall be understood to mean furnish and install, unless otherwise expressly stated.

Where used in the Contract Documents, statement or command type phrases (i.e., active voice and imperative mood) refer to and are directed at the Contractor.

1-2 TERMS AND DEFINITIONS.

Contract Documents – DELETE in its entirety and SUBSTITUTE with the following:

Contract Documents – The Agreement, Addendum, Invitation to Bid, Instructions to Bidders, Bid and documentation accompanying the Bid and any post-bid documentation submitted prior to the Notice of Award when attached as an exhibit to the Contract, Bonds, permits from jurisdictional regulatory agencies, Supplementary Special Provisions (SSP), City's EOCP Requirements, City Supplement, Plans, Standard Plans, Construction Documents, Reference Specifications listed in the Invitation to Bid or the RFP for Design-Build contracts, Request for Qualifications (RFQ), Statement of Qualifications (SOQ), Request for Proposals (RFP), and modifications issued after the execution of the Contract e.g., Change Orders.

Notice to Proceed (NTP) – For Design-Build Contracts, DELETE in its entirety and SUBSTITUTE with the following:

Construction Notice to Proceed - The notice given by the City to the Design-Builder stating that the Site is available to the Design-Builder and authorizing the Design-Builder to commence construction of the Project or parts of the Project.

Design Notice to Proceed - The written authorization that the Design-Builder may begin design of Project. The initial Design NTP stipulates the date on which the Contract Time will start.

ADD the following definitions:

Acceptance – The Engineer's written confirmation that the Work has been completed in compliance with the Contract Documents.

Adjustment Factor – For GRC contracts, the Contractor's competitively bid price adjustment to the unit prices published in the UPB including all items as noted in the executed Contract.

Allowance - See 9-4, "ALLOWANCE."

Apparent Low Bidder - The Bidder whose Bid, having been publicly opened and read aloud, meets the material requirements of the Bid Documents, and whose Bid price is the lowest received.

Applicable Laws - Laws, statutes, ordinances, rules, orders, and regulations of governmental authorities and courts having jurisdiction.

Architect-Engineer - The Design-Builder or its designated Architect-Engineering firm.

As-builts - The CADD drawings prepared from the approved Red-lines for record keeping purposes.

Award of Contract - Date of - Date on which the Mayor or designee executes the Contract.

Bridging Documents – The City’s preliminary and conceptual plans and specifications that are to be used by Design-Builder as a minimum basis to design and construct the Project in a Design-Build contract. See Design-Build RFP, Attachment A.

Business Day - See Working Day.

CEQA - The California Environmental Quality Act.

Certificate of Compliance – A written document signed and submitted by a supplier or manufacturer that certifies that the material or assembled material supplied to the Work site comply with the Specifications and Plans.

City - The City of San Diego. See Agency.

City Forces - Employees of the City who perform construction work.

Construction Phase – For Design-Build contracts, the period set forth in the Schedule beginning with the issuance of the Construction Notice to Proceed and ending on the date of Acceptance.

Construction Work - The portion of the Work to construct the Project as set forth in the Contract Documents in conformance with 2-6, “WORK TO BE DONE.”

Construction Documents – The Design-Builder's plans and details, including plans showing installation of major systems, equipment, fixed furnishings and graphics, the technical specifications and all other technical drawings, schedules, diagrams and specifications, accepted Shop Drawings, Working Drawings, and submittals that are necessary to set forth in detail the requirements for the Project.

Construction Manager - The Construction Manager may be:

- a) an employee of the City; see Engineer or
- b) an independent consultant hired by the City.

Consultant - The individual, partnership, corporation, joint-venture, or other legal entity named as such in the Contract Documents or succeeding entity (e.g., architects and engineers) who function under the direction of the Engineer for Project design or other specialized services.

Contract Time - The number of days as stated in the Contract Documents for the completion of the Work starting with NTP and ending with Acceptance.

Defective Work - Work that does not conform to the Contract Documents prior to Acceptance.

Designer – See Architect-Engineer.

Design-Builder – See Contractor.

Design Items of Work - That portion of the Work consisting of the professional design services required to be provided in connection with the design of the Project or portions of the Project as set forth in the Contract Documents.

Design Materials - Documents, Shop Drawings, and Working Drawings, electronic information, data, plans, drawings, sketches, illustrations, specifications, descriptions, models and other information developed, prepared, furnished, delivered or required to be delivered by the Contractor (a) to the City under the Contract Documents or (b) developed or prepared by the Contractor specifically to discharge its responsibilities as set forth in the Contract Documents.

Design Phase - The period set forth in the Schedule commencing with the Design-Builder's receipt of a Design NTP and ending upon the date the City approves the Construction Documents.

Drawings – See Plans.

Execution of Contract - Date of – See Award of Contract.

Field Book – The City of San Diego Sewer Field Book or Water Field Book where applicable.

Field Order - See 9-3.6, “Field Orders.”

Final Environmental Document - The CEQA document issued for the Project, e.g., a certified environmental impact report, mitigated negative declaration, negative declaration, or an exemption.

Final Payment - The last payment for the Contract made to the Contractor excluding Retention.

Governmental Approvals - Those governmental, including agency actions required to be obtained by the City or the Contractor as specified in the Contract Documents and necessary for the completion of the Project, including, but not limited to, modification of existing zoning, vacation of certain streets and/or alleys, and modifications to or variances from applicable building codes, all as more fully described in the Contract Documents.

Holiday - The City-observed holidays are listed below. If any holiday listed falls on a Saturday, the Saturday and the preceding Friday are both legal holidays. If the holiday falls on a Sunday, both Sunday and the following Monday will be legal holidays:

<u>Holiday</u>	<u>Observed On</u>
New Year’s Day	January 1
Martin Luther King Day	3 rd Monday in January
Presidents Day	3 rd Monday in February
Caesar Chavez Day	March 31
Memorial Day	Last Monday in May
Independence Day	July 4
Labor Day	1 st Monday in September
Veteran’s Day	November 11
Thanksgiving Day	4 th Thursday in November
Christmas Day	December 25

No work shall be performed on holidays **unless specified otherwise in the** Contract Documents or authorized by the Engineer.

Instructions to Bidders – A Contract Document with general directions and procedures for submission of the Bid and Award procedure.

Invitation to Bid – A Contract Document that includes project specific requirements for submission of the Bid or those required by law and the City’s general bid and award instructions issued in conjunction with the award of the Contract.

Joint Scope Meeting – For GRC contracts, a meeting at the Task Order location, attended by the Engineer, Contractor, and any other interested parties to outline the Scope of work for the Task.

Non-Pre-Priced (NPP) Tasks – For GRC contracts, the units of Work that are not included in the UPB but are still within the general scope of Work requested by the Engineer under the Contract.

Normal Working Hours - **Unless specified otherwise**, 7:00 AM to 5:00 PM, Monday through Friday, inclusive. Saturdays, Sundays, and City holidays are excluded.

Mayor or designee - The City’s Mayor or a designated representative.

Notice of Completion (NOC) – A document filed by the City with the County Recorder, if in the City’s judgment, the Work has been completed. NOC stipulates the date that the Work was accepted.

Order of Magnitude Documents – For Design-Build contracts, the drawings, specifications and other documents by the Design-Builder for the City's review and approval prior to the preparation of the Construction Documents.

Owner – See City.

Party or Parties - The City, the Contractor, or both, their respective permitted successors or assigns, and any other future signatories to this contract.

Prime Contractor – See Contractor.

Project - The Project is the object of this contract to be constructed by the Contractor as specified, described, and shown in the Contract Documents.

Project Site - All areas where Work is to be performed pursuant to this contract.

Quality Control Standards and Procedures – The standards and procedures that are stated in a written manual that can be furnished to the City upon request. The standards and procedures are followed by the Supplier in the production of materials supplied to the Work site.

Red-lines - Plans with annotations of changes made during construction, in red, to reflect the actual product built during construction whether concealed or visible.

Request for Proposal (RFP) – See below:

Design-Build Contracts:

- a) The solicitation by the City to prospective proposers upon which an evaluated selection of a Design-Builder will be made by the City.
- b) The standardized form used by the City to request a Proposal from the Design-Builder for proposed changes in the Work.

GRC Contracts:

- a) The City’s request for proposal for a Task.

Request for Qualifications (RFQ) - The City’s solicitation to prospective Design-Builders for SOQ.

Retention - The amount withheld by the City from the money due to the Contractor in accordance with 9-3.2, “Partial and Final Payment”.

Punchlist - List of items of Work or corrections required to comply with the Contract Documents.

Schedule – Contractor prepared and City accepted Critical Path Method (CPM) schedule in accordance with 6-1, “CONSTRUCTION SCHEDULE AND COMMENCEMENT OF THE WORK.”

Scope of Work (SOW) - Labor, materials, equipment, facilities, and services required to be performed or provided by the Contractor to complete the entire Project or the various separately identifiable parts thereof pursuant to the provisions of the Contract Documents.

Services - Professional services e.g., design, engineering, and construction management of the Project that are required in accordance with the Contract Documents. Services shall be included in the Work.

Supplier - Manufacturer, fabricator, distributor, dealer, or vendor.

Separate Contractors - Those individuals or entities that have entered into arrangements with the City for the provision of labor, materials, or other services in connection with the Project who are not under contract with the Contractor.

Shop Drawings – Drawings submitted by the Contractor showing details of manufactured or assembled products proposed to be incorporated into Work.

Statement of Qualifications (SOQ) - The document submitted by any individual, firm, partnership, corporation or combination thereof, in response to the RFQ and for the consideration by the City as to the individual, firm partnership, corporation or combination thereof expertise, experience and capabilities to perform the Work required of the Design-Build Project.

Subconsultant – See Subcontractor.

Subcontract - Agreement between the Contractor and a Subcontractor.

Supplier - Manufacturer, fabricator, distributor, dealer, or vendor.

Task – For GRC contracts, a project assigned to a specific GRC Contract which will be constructed by the Contractor in accordance with the terms of the GRC Contract to which it is assigned.

Task Order Authorization - For GRC contracts, the documents transmitted by the City to the Contractor which indicate the work instructions, scope of work and time duration allotted for a particular GRC Task or Project.

Task Order Proposal - For GRC contracts, the Contractor's irrevocable offer to perform Work associated with a Task Order and refers to the Contractor prepared document quoting a firm fixed-price and schedule for the completion of a specific Scope of Work. The Contractor's Proposal shall be on electronic forms provided by the City and in an electronic version compatible with the City's systems. The Proposal Submittal may also require a work schedule, EOC forms, or other such documentation as the City might require for a specific Task Order. The proposal is comprised of line items from quotes and line items from the Unit Price Book for various construction components required to complete the project.

Unit Price - For GRC contracts, the price published in the UPB for a specific construction or construction-related line item. The Unit Prices are fixed for the duration of the contract. Each Unit Price shall be comprised of the labor, equipment, services, and materials costs to accomplish that specific line item.

Unit Price - For GRC contracts, the price published in the UPB for a specific construction or construction-related task. The Unit Prices are fixed for 12 months from the Award of Contract. Each Unit Price shall be comprised of the labor, equipment, services, and materials costs to accomplish that specific task.

Unit Price Book (UPB) – For GRC contracts, a comprehensive listing of specific construction related tasks identified by the City together with a specified unit of measurement and unit price.

Walk-through - The procedure used by the City to evaluate status of the Project and generate a Punchlist.

Working Drawings – The Contractor submitted drawings showing details of Work not shown on the Plans.

Working Day – Any day within the period between the dates of the start of the Contract Time in accordance with 6-1, “CONSTRUCTION SCHEDULE AND COMMENCEMENT OF THE WORK” and the acceptance of the Work (Acceptance) other than days listed in 6-7.2, “Working Day”.

Work Site – See Project Site.

SECTION 2 – SCOPE AND CONTROL OF WORK

2-1 AWARD AND EXECUTION OF CONTRACT. DELETE in its entirety and SUBSTITUTE with the following:

Award and execution of the Contract shall be **as provided for in the Special Provisions**, Instructions to Bidders, Invitation to Bid, or as provided for in this contract and the Request for Proposals (RFP).

ADD the following for GRC contracts only:

After award of the Contract, the City will assign Task Orders to the Contractor as the need arises for work. When a Task is assigned to the Contractor, the City will, arrange an initial site visit, called a Joint Scope Meeting, with the Contractor, and other interested parties at the location of the proposed Task. At the Joint Scope Meeting, the Scope of Work for the Task will be presented, by the City, to the Contractor.

Upon completion of the Joint Scope Meeting, the City will issue a Request for Proposal (RFP), which requires that the Contractor prepare a Proposal for the Work under consideration in 14 days or less as indicated on the RFP.

ADD: 2-1.1 Task Orders. For GRC contracts, individual Task Orders shall be subject to the Contract in its entirety. This is an indefinite-quantity contract for the supplies or services specified and effective for the period of 24 months from the date of the Notice to Proceed or the expenditure of the Maximum Contract Value as stated in the Notice Inviting Bids, whichever occurs first.

The Contractor will be required to Work at any of the City’s facilities. The City makes no commitment as to the award of individual Task Orders. All costs associated with preparing proposals shall be the responsibility of the Contractor.

Work or performance shall be made only as authorized by Task Orders issued in accordance with these specifications. The Contractor shall furnish to the City, the supplies or services specified in the Task Orders up to and including the Maximum Contract Amount. The City shall order at least the Minimum Contract Amount of construction services designated in the Contract Documents.

The Scope of Work of this contract shall be determined by individual Task Orders. The Contractor shall complete the Task Order per 2-6, “Work to Be Done.” The Contractor shall provide quality assurance as specified in strict accordance with the Contract requirements.

The Work will be ordered and funded when needed in accordance with the procedures contained in the Contract Documents.

Before the issuance of the first Task Order under this contract, a conference will be conducted by the City to acquaint the Contractor with City policies and procedures that are to be observed during the execution of the Work and to develop mutual understanding relative to the administration of the Contract.

Except in an "emergency response" the Contractor is not to proceed with any Task Order without having required permits and an NTP signed by the GRC Contract Manager.

In the event that “immediate emergency response” is necessary, the City may elect to use an alternative procedure for such type of Task Orders as long as the alternative procedure is not substantially more burdensome to the Contractor than the procedure described in this subsection.

Proposals submitted by the Contractor are valid for the duration of the Contract.

Before ordering any material or doing any Work, the Contractor shall verify all measurements and existing conditions at the site of a specific Task Order, and shall be responsible for the correctness of the measurements and existing site conditions indicated in Task documents. No extra charge or compensation will be allowed based on the difference between actual dimensions and the measurements indicated in the Request for Proposal. The Contractors shall verify such items prior to submission of the Proposal.

The City will not entertain claims for additional money, when such claim is based upon a contention the Contract fails to mention a specific item or component of facility covered by the Task Order and the Work is required in the normal course of operations. For example, surfaced area repair statements may not mention culverts. However, culverts are a normal component of roads, streets, or erosion controls and are shown on plots or maps provided. As culverts are a normal component of the system, the Contractor shall be responsible for providing all necessary repair, or replacement Work or service.

2-1.1.2 Procedure for Ordering Work. As the need for work arises, the City will notify the Contractor of the Work in writing and schedule a Joint Scope Meeting. Upon receipt of this notification, the Contractor shall respond within one Working Day by:

- a) Accepting the Joint Scope Meeting electronically or declining the Joint Scope Meeting electronically and offering electronically alternate dates and times within one week of the initial appointment request.
- b) Visiting the proposed Work Site in the company of the Engineer and Project Manager, and participating in the Joint Scope Meeting which will include discussion and establishment of the following:
 - i. Project number and title.
 - ii. Existing site conditions.
 - iii. Methods and alternatives for accomplishing Work.
 - iv. Definition and refinement of requirements.
 - v. Detailed Scope of Work.
 - vi. Requirements for, sketches, Shop Drawings, Working Drawings, submittals, permits, construction schedules, EOC Compliance, etc.
 - vii. Tentative construction schedule.
 - viii. Preliminary quantity estimates when known by the Engineer.

The City reserves the right to reject a Contractor’s proposal based on unjustifiable quantities, performance periods, inadequate documentation, or other inconsistencies on the Contractor’s part. The City reserves the right to issue a NTP to the Contractor without having a mutual agreement on a final Task Order price.

The Contractor will be paid by multiplying the actual quantities used by the appropriate unit Price Book unit price and the applicable Adjustment Factors. Non-Pre-Priced (NPP) Tasks will be priced according to the Total Cost formula set forth in 3-2.3, “Stipulated Unit Prices.” The City reserves the right to not award a Task Order if it is determined to be in the best interests of the City or the proposed cost exceeds the City’s estimate. If the City does not award a Task, the City shall not be liable for proposal expenses.

By submitting a signed Proposal to the City, the Contractor is agreeing to accomplish the Work outlined in the Scope of Work for that particular Task Order. The Contractor shall include the necessary scope items in the proposal prior to delivering it to the City.

Each Task Order provided to the Contractor shall state the agreed upon requirements and fixed price of performance. Task Orders will be written on a City provided form. The Task Order signed by the GRC Contract Manager shall constitute the City's acceptance of the Contractor's Proposal. For Tasks that are issued to the Contractor, a signed copy of the proposal and Notice to Proceed will be provided to the Contractor.

2-1.1.3 Processing Time Limits. The Contractor shall submit a Proposal for the Task to the Engineer on or before the due date stated in the RFP that is 14 days maximum **unless otherwise specified**.

The Contractor shall analyze each work order and shall submit all Requests for Information (RFI) within 7 days after issuance of any RFP. Submission of RFI's shall in no way extend the proposal due date unless deemed necessary by the Engineer.

The Contractor's project manager or agent shall be available for proposal review meetings within 24 hours of being notified by the City via fax, e-mail, or telephone. After review of the proposal, the Contractor shall remove all inappropriate line items and adjust quantities as directed by the Engineer.

Only on the Contractor's second proposal shall the Contractor be granted the opportunity to add new valid line items that may have been omitted from the first proposal. The Contractor shall submit a revised proposal within 24 hours of proposal review meeting, **unless otherwise specified**. Upon review of revised proposal, the Contractor shall remove all line items or adjust quantities deemed inappropriate by the Engineer and re-submit the proposal within 24 hours. No new line items may be added to the proposal. No quantity increases or added modifiers will be accepted unless agreed to by the City during the second proposal review meeting.

Timely submittal of Proposals is of the essence. If the Contractor fails to submit a Proposal in accordance with in these specifications, liquidated damages will be assessed and collected in accordance with 6-9, "LIQUIDATED DAMAGES."

ADD: 2-1.2 STANDARD CONTRACT PROVISIONS.

2-1.2.1 Document Ownership. Once the Contractor has received any compensation for the Work performed, all electronic or hard copy documents, e.g., original plans, studies, sketches, drawings, computer printouts and files, and specifications prepared in connection with or related to the Work shall be the property of City. The City's ownership of these documents includes use of, reproduction or reuse of, and all incidental rights, whether or not the item of the Work for which they were prepared has been performed.

The City's ownership entitlement arises upon payment or any partial payment for Work performed and includes ownership of any and all Work product completed under this contract. This subsection shall apply whether the Contractor's services are terminated: (a) by the completion of the Project; or (b) in accordance with other provisions of this contract. Notwithstanding any other provision of this subsection or the Contract, the Contractor shall have the right to make copies of all such plans, studies, sketches, drawings, computer printouts and files, and specifications.

The Contractor shall not be responsible for damage caused by subsequent changes to or uses of the Plans or Specifications, where the subsequent changes or uses are not authorized or approved by the Contractor, provided that the service rendered by the Contractor was not a proximate cause of the damage.

2-1.2.2 Joint Venture Contractors. If the Contractor is a joint venture, all grants, covenants, provisions and claims, rights, powers, privileges and liabilities of the Contract shall be construed and held to be several as well as joint. Any notice, order, direct request or any communication given by the City to the Contractor, shall be given to all entities being the Contractor if given to any one or more of such entities. Any notice, request or other communication given by any one of such entities to the City under this contract shall be deemed to have been given by and shall bind all entities being the Contractor.

The Joint Venture shall designate an on-site representative and an alternate in writing. The on-site representative and the alternate shall have the full authority to bind all Joint Venture partners.

The Joint Venture shall provide a copy of the Joint Venture agreement and the Joint Venture license to the City at the time of Contract award.

2-1.2.3 Successor's Obligations. All grants, covenants, provisions and claims, rights, powers, privileges and abilities contained in the Contract Documents shall be read and held as made by and with, and granted to and imposed upon, the Contractor and the City and their respective heirs, executors, administrators, successors, and assigns.

2-1.2.4 Waiver of Legal Rights. The failure of the City to insist, in any one or more instances, upon the performance of any provision of the Contract, or to exercise any right therein, shall not be construed as a waiver or relinquishment of such provisions or rights. Any waiver of any breach of this contract shall not be held to be a waiver of any other or subsequent breach.

Any waiver issued by the City of any provision of the Contract shall only be effective if issued in writing by the City and shall be specific, shall apply only to the particular matter concerned and not to other similar or dissimilar matters.

2-1.2.5 Requests for Information (RFI). If the work to be done is not sufficiently detailed or explained in the Contract Documents, the Contractor shall submit in writing a request to the Engineer for further explanations. Questions related to the Work shall be addressed to the Engineer for the Engineer's decision pursuant to 2-10, "AUTHORITY OF THE BOARD AND THE ENGINEER."

2-1.2.6 Headings. All section headings are for convenience only and shall not affect the interpretation of this contract.

2-1.2.7 Cumulative Remedies. The duties and obligations imposed by this contract and the rights and remedies available hereunder to the Parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon the Contractor by this contract and all of the rights and remedies available to City thereunder; are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents.

2-1.2.8 Public Works Contracts; Assignment to Awarding Body. In accordance with § 7103.5(b) of the California Public Contract Code (A.B. 3416), the Contractor and Subcontractors shall conform to the following requirements. In entering into a public works contract or a Subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or Subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under § 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with § 16700) of Part 2 of Division 7 of the Business and Professions Code) arising from purchases of goods, services, or materials pursuant to the public works contract or the Subcontract. This assignment shall be made and become effective at the time the awarding body tenders to the Contractor, without further acknowledgment by the Parties.

2-3.1 General. ADD the following:

Subcontractors shall be qualified, sufficiently experienced, and appropriately licensed architects, engineers, and contractors. The construction contractors shall be appropriately licensed by the California Contractors State License Board. The use of Subcontractors in no way relieves the Contractor of any obligations or responsibilities under this contract.

ADD: 2-3.1.1 Suppliers List. The Contractor warrants that it has listed all Suppliers known to the Contractor at the time of Award on the City provided forms attached to this contract. If the Suppliers are required that were not listed by the Contractor prior to Award, the Contractor shall let the supply subcontract in accordance with a competitive bidding process performed at the Contractor's expense.

ADD: 2-3.1.2 Subcontractor List. The listing of Subcontractors provided by the Contractor, in compliance with the "Subletting and Subcontracting Fair Practices Act" (Public Contract Code §§4100-4114, inclusive), shall not be modified without the prior written approval of the City.

If at any time after Award of the Contract the Contractor identifies a need for additional Subcontractor services, the Contractor shall immediately request in writing the City's consent. The request shall include a justification, a description of the work, and an estimate of the costs for the services.

2-3.2 Self Performance. ADD the following:

The requirement for the Contractor to perform with its own organization, Contract work amount to at least 50% of the Contract Price will be waived for contracts when a "B" License is required.

The requirement for the Contractor to perform with its own organization, Contract work amount to at least 50% of the Contract Price applies only to the base Contract amount awarded less Specialty Items, and shall not apply to Additive or Deductive Alternate Work described in the Bid documents.

ADD: 2-3.4 Subcontract Requirements. The Contractor shall incorporate these specifications in its Subcontracts to the extent of the Work to be performed by such Subcontractor.

The Contractor shall obtain or require that each Subcontractor obtain insurance policies in accordance with 7-3, "LIABILITY INSURANCE" which shall be kept in full force and effect during Work on this project and for the duration of this contract.

In any dispute between the Contractor and the Subcontractor, the City shall not be made a party to any judicial or administrative proceeding to resolve the dispute.

For Design-Build contracts, contracts entered into between the Design-Builder and a Subcontractor shall provide as follows:

- a) The Design-Builder shall not hire or allow any entity e.g., City consultant and any sub-consultant who participated in creating City's Bridging Documents or Contract Documents for this Project to participate in design services, construction management, and any other construction services related in any way to this Project without the prior written consent of City.
- b) The Design-Builder shall pay Subcontractors for the Design-Builder- and the City-approved invoice amounts, out of amounts paid by the City to the Design-Builder, not later than 14 days from the Design-Builder's receipt of payment from the City. Nothing in this paragraph shall be construed to impair the right of the Design-Builder and any Subcontractor to negotiate fair and reasonable pricing and payment provisions among themselves.

- c) In the case of a deficiency in the performance of Subcontractor's services, the Design-Builder shall notify City in writing of any withholding of payment to the Subcontractor, specifying: (a) the amount withheld; (b) the specific cause under the terms of the subcontract for withholding payment; (c) the connection between the cause for withholding payment and the amount withheld; and (d) the remedial action the Subcontractor shall take in order to receive the amount withheld. Once the Subcontractor corrects the deficiency, the Design-Builder shall pay the Subcontractor the amount withheld within 14 working days of Design-Builder's receipt of City's next payment.

2-4 CONTRACT BONDS. First paragraph, DELETE second and third sentences and SUBSTITUTE with the following:

Bonds shall be executed by a responsible surety as follows:

- a) If the Work is being funded with state or local money, consistent with California Code of Civil Procedure §995.670, the Surety shall be an "admitted surety" authorized by the State of California Department of Insurance to transact surety insurance in the State.
- b) If the Work is being funded with federal money, the Surety shall be listed in the U.S. Treasury Department Circular 570 and in conformance with the Underwriting Limitations as expressed therein.

DELETE the third and fourth paragraphs and SUBSTITUTE with the following:

The Contractor shall provide the following bonds:

- a) Contracts less than \$10,000:
 - i. A "Payment Bond" (Materials and Labor Bond) is optional. If no bond is submitted, no payment will be made until 35 days after NOC has been recorded and any lien requirements have been fulfilled. If a bond is submitted, progress payments will be made in accordance with these Specifications.
 - ii. A "Faithful Performance Bond" is not required.
- b) Contracts over \$10,000 and less than \$25,000:
 - i. A "Payment Bond" (Materials and Labor Bond) is optional. If no bond is submitted, progress payments may be made with a minimum of 20% retention. If a bond is submitted, progress payments will be made in accordance with these Specifications.
 - ii. A "Faithful Performance Bond" is not required.
- c) Contracts over \$25,000 and less than \$100,000:
 - i. A "Payment Bond" (Materials and Labor Bond) for not less than 100% of the Contract Price, to satisfy claims of material Suppliers and of mechanics and laborers employed on the Work. The bond shall be maintained by the Contractor in full force and effect until the Work is accepted by the City and until all claims for materials and labor are paid, and shall otherwise comply with the Government Code.
 - ii. A "Faithful Performance Bond" is not required.
- d) Contracts over \$100,000 or where submitted on optional basis:
 - i. A "Payment Bond" (Materials and Labor Bond) for 100% of the Contract Price, to satisfy claims of material Suppliers and of mechanics and laborers employed on the

Work. The bond shall be maintained by the Contractor in full force and effect until the Work is accepted by the City and until all claims for materials and labor are paid, and shall otherwise comply with the Government Code.

- ii. A "Faithful Performance Bond" for 100% of the Contract Price to guarantee faithful performance of Work, within the time prescribed, in a manner satisfactory to the City, and that materials and workmanship will be free from original or developed defects.

e) Contracts over \$100,000 which include CDBG - HUD Program Funds:

- i. A "Payment Bond" (Material and Labor Bond) for 100% of the Contract Price, to satisfy claims of material Suppliers and of mechanics and laborers employed on the Work. The bond shall be maintained by the Contractor in full force and effect until the Work is accepted by the City and until all claims for materials and labor are paid, and shall otherwise comply with the Government Code and Public Contract Code.
- ii. A "Faithful Performance Bond" for 100% of the Contract Price to guarantee faithful performance of Work, within the time prescribed, in a manner satisfactory to the City, and that materials and workmanship will be free from original or developed defects.

The bond shall remain in effect until the end of warranty periods set forth in the Contract.

ADD the following:

If the Surety on any bond furnished by the Contractor is declared bankrupt, becomes insolvent, or its right to do business is terminated in any state where any part of the Project is located, the Contractor shall immediately notify the Engineer and immediately substitute another bond and surety acceptable to the City.

The Contractor shall require the Surety to mail its standard "Bond Status" form to the City at the following address:

Deputy Director
Field Engineering Division
9485 Aero Drive
San Diego, CA 92123

ADD: 2-4.1 Bond Payments. The Bid item for bonds shall include full compensation for actual costs of payment and performance bonds. The Contractor may submit a request for payment of actual invoiced costs up to the bid amount, but not to exceed 2.5% of the Contract Price, not less than 10 Working Days after Award of the Contract.

If the Bid item for bonds exceeds actual invoiced costs, any such differential amount up to the bid amount, shall be paid as a part of the Final Payment.

2-5 PLANS AND SPECIFICATIONS. ADD the following for GRC contracts:

No plans have been prepared by the City for the purposes of bidding or construction. Specific work instructions for each Task will be issued to the Contractor on the Task Authorization. The work instructions on the Task Authorization will have the same rank as "Plans" when used in conjunction with 2-5.2, "Precedence of Contract Documents."

2-5.1 General. ADD the following:

Specifications and Plans are divided into groups e.g., engineering disciplines for the convenience of the City. These divisions are not for the purpose of apportioning the Work or responsibility for the Work among Subcontractors and Suppliers.

It is the intent of the Specifications and Plans to describe a complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work that may reasonably be inferred from the Specifications or Plans as being required to produce the intended result shall be supplied whether or not it is specifically called for, at no additional cost to the City.

Reference to specified software, guides, standard specifications, manuals or codes of any technical society, organization or association, or to the code of any governmental authority, whether such reference be specific or by implication, shall mean the latest edition or version in effect when the Contract is advertised (or, on the effective date of the Contract if there were no Bids), except as may be otherwise specifically stated. If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued.

2-5.2 Precedence of Contract Documents. DELETE in entirety and SUBSTITUTE with the following: If there is a conflict between any of the Contract Documents, the document highest in precedence shall control. The precedence shall be as follows:

- 1) Permits (i.e., issued by jurisdictional regulatory agencies)
- 2) Change Orders and Supplemental Agreements; whichever occurs last
- 3) Contract and Agreement
- 4) Addenda
- 5) Bid (e.g., price Proposal for Design-Build contracts)
- 6) Request for Proposal (RFP)
- 7) Invitation to Bid
- 8) Instruction to Bidders
- 9) Request for Qualifications (RFQ)
- 10) Special Provisions (i.e., City's EOCP Requirements, City Supplement, and Supplementary Special Provisions (SSP))
- 11) Plans
- 12) Construction Documents (for Design-Build contracts)
- 13) Standard Drawings
- 14) Reference Specifications (e.g., GREENBOOK)
- 15) Technical Proposal (for Design-Build contracts)
- 16) Statement of Qualifications (SOQ)

When additional requirements by the funding sources are physically or by reference incorporated in the Contract Documents, the funding source's requirements shall govern **unless specified otherwise**.

Figured dimensions shall take precedence over scaled dimensions. Detailed drawings shall take precedence over general drawings.

TABLE 2-5.3.3(A), ADD the following:

Item	Section No.	Title	Subject
18	306-1.6	Thrust blocks and anchor blocks	Unless specified otherwise, design of all size water main thrust blocks and anchor blocks

2-5.3.4 Supporting Information. ADD the following:

For landscaping and irrigation materials, samples and test results shall be submitted to the Engineer within 15 days of the NTP in accordance with 2-5.3, "Submittals."

Samples of the materials accompanied by cut sheets of the products shall be submitted. Cut sheets shall be organized in a binder for review and approval by the Engineer prior to use on the Project. Deviation from any of the specified material shall be clearly identified, including cut sheets and samples of both the specified material and basis for the substitution.

ADD: 2-5.4 Red-lines.

2-5.4.1 General. The Contractor shall keep, to the satisfaction of the Engineer, accurate, legible, and current records on a set of full size Plans of additions and deletions to the Work, and of changes in location, elevation, and character of the Work not otherwise shown or noted on Contract documents.

Red-lines drawings shall be coordinated with field measurements, approved Shop Drawings, Working Drawings, samples, product data, and available records. The Contractor shall immediately give written notice of any conflicts between these documents to the City.

The Red-lines shall be kept current with entries checked by the Engineer before the Work is buried or covered. The Contractor's failure to update and deliver Red-lines information monthly to the Engineer for review and approval may result in withholding of monthly progress payments.

The Red-lines shall be delivered to the Engineer upon completion of the construction work.

2-5.4.2 Asset Specific Red-lines. The Red-lines for various asset types shall be subject to the following requirements:

- a) Irrigation system Red-lines: Red-lines shall clearly record by dimension from 2 known fixed points and by depth of underground facilities all deviations, modifications, and changes in the Work. Deviations, modifications, and changes shall be recorded on the day the work is performed; reflect the actual work location(s); be recorded in red and at the scale of the Plan sheet on which they are recorded. Red-lines shall show the following equipment locations and associated information:
 - i. Water Meter - Size, type of water (potable or reclaimed) and water meter address
 - ii. Electrical Meter including meter address
 - iii. Backflow Device - Size, available static pressure in PSI, the PSI and gpm for which the irrigation system is designed, and device serial number
 - iv. Irrigation Controller - Location, number of stations, identifying call-out.
 - v. Master Control Valve
 - vi. Flow Sensor
 - vii. Pressure Regulator Valve
 - viii. Isolation Valves

- ix. Remote Control Valves - Size, irrigation controller, valve station number and gpm demand
 - x. Quick Coupling Valves and size
 - xi. Irrigation Mainline and Size
 - xii. Potable Water Mainline and Size
 - xiii. Irrigation Lateral Line and Size
 - xiv. Irrigation Sleeves and Size
 - xv. Remote Control Valve Wiring
 - xvi. Communication Cables
 - xvii. Pull Boxes
 - xviii. Rain Shut Off Switch
 - xix. Electrical lines from electrical meter to irrigation controller including the power disconnect switch
 - xx. Irrigation sprinkler heads which have been added or deleted from the approved plans. Changes in manufacturer nozzle size shall be noted on the red-lined drawings including operating pressure, gallons per minute and radius of throw.
- b) Revegetation Red-lines: Within 4 weeks of the end of the PEP as determined and accepted by the Project Biologist, the Contractor shall furnish and submit to the Engineer 1 full scale Red-line set showing field changes to grade, erosion control, and seeding for the re-vegetated areas.
- c) Utility Red-lines: Utility Red-lines shall show the location of:
- i. Blowoff valves by stationing and offsets.
 - ii. Air vacuum valves by stationing and offsets.
 - iii. Water meter boxes replaced.
 - iv. Locations of all sewer laterals and cleanouts.
- d) Building Red-lines: Building Red-lines shall show:
- i. Location by dimension and the depth by elevation of underground line, valves, plugged tees, and capped ends.
 - ii. By dimension or scale plans, wiring, conduits, and pull boxes as installed.
 - iii. Information necessary to maintain and service concealed items of Work.
- e) SWPPP: Upon completion of construction, the SWPPP and all of its appendices, records, reports, and maps, shall be submitted to the Engineer with the Red-lines.
- f) Traffic Signals and Street Lighting: For traffic signals and street lighting, the Contractor shall provide the Engineer with a cable route diagram indicating the actual cable route and meter marks for all intersections, directional change points in the cable routing, and all termination points. The Contractor shall record these points during cable installation. Cable system as-built drawings showing the exact cable route shall be provided by the Contractor to the Engineer. Information such as the location of slack cable and its quantity shall also be recorded in the cable route diagram.
- g) Following dewatering operation, any items abandoned in place shall be indicated on the Red-lines.

2-5.4.3 Payment. The payment for Red-lines drawings shall be included in the various Bid items.

ADD: 2-5.5 As-builts. For Design-Build contracts or **when required in the Special Provisions** for other contract types, As-builts shall be the responsibility of the Contractor.

The As-built drawings shall include the information required for various asset types listed in 2-5.4.2, "Asset Specific Red-lines."

Prior to Acceptance, the Contractor shall prepare and submit one complete set of full sized (24" x 36") original Mylar final As-built Drawings (CADD plots) prepared in accordance with the City's CADD standards. Each CADD Mylar drawing sheet shall be wet stamped and signed by qualified responsible engineers registered in the State of California, and shall be stamped and wet signed by the architect or engineer of record, as required by law. Other applicable portions of the drawing title blocks shall also be signed by Contractor. Drawing Mylar shall be 3 mils minimum thickness.

The payment for As-built drawings shall be included in the various Bid items.

ADD: 2-5.6 Measurements and Dimensions. Scaled dimensions are approximate. Before ordering materials or commencing Work, measure site for proper size and fit. The Contractor shall verify dimensions and quantities by taking measurements in the field and shall be responsible for their correctness.

ADD: 2-5.7 Order of Magnitude Documents and Construction Documents. For Design-Build contracts, after the Design NTP, the Design-Builder shall prepare the Order of Magnitude Documents for review and approval by the City. After such approval, the Design-Builder shall prepare the Construction Documents. The Order of Magnitude Documents and Construction Documents shall be developed and detailed and be consistent with the intent of the Contract Documents, and shall include documents customarily required for regulatory approval by governmental agencies.

The Order of Magnitude Documents shall illustrate the scale and relationship of Project components, outline the nature and structural exterior and three dimensional scale of the Project and shall fix and describe in detail the configuration and character of the Project concerning all items of the Project necessary for the complete and final preparation of the Construction Documents in accordance with the requirements of the Contract Documents, including architectural, mechanical and electrical systems, materials and such other elements as may be appropriate.

The Construction Documents shall provide information customarily necessary for the use of such documents by those in the building trades and include all documents required for the complete and final construction of the Project, other than such details customarily developed in Working Drawings and Shop Drawings or otherwise during construction.

The Design-Builder shall be fully responsible for obtaining all reviews and approval for building permit(s) independently of Order of Magnitude Documents review required.

2-5.7.1 Use of Computer Aided Drafting and Design (CADD). The Design-Builder shall use CADD for the preparation of Plans and As-built drawings in accordance with City's CADD Standards. Conversions of CADD work from any CADD format to City standard MicroStation format shall not be acceptable **unless specified otherwise** in the Contract Documents.

2-5.7.2 Reliance on Approvals. The Design-Builder shall be entitled to rely on the approvals of the City as to general scope and purpose, as set forth in the Bridging Documents. In no event shall City approval be considered a specific approval with respect to the Design Materials. The City will have the right to accept, reject or suggest change to the Order of Magnitude Documents to achieve conformity with general scope as set forth in the Bridging Documents, with no increase in Contract Price or Contract Time.

If the City revokes, modifies or otherwise changes in a material way its approval of a portion of the Project after such portion of Work has been designed and approved, or modifies the original the Bridging Documents in a material manner requiring modification to one or more systems which have been designed and approved, the Design-Builder shall be entitled to a Change Order per Section 3,

“CHANGES IN WORK” provided that prior to such approval the Design-Builder has made the City aware of future design decisions which may be affected by such approval. No Change Order will be issued to the extent such Change Order is due to the fault or neglect of the Design-Builder or any increase in cost due to any unauthorized deviations from the Bridging Documents.

2-5.7.3 Review of Construction Documents and Field Conditions. The Design-Builder shall be responsible for all errors, inconsistencies or omissions in the Construction Documents. The Design-Builder shall take field measurements and verify field conditions and shall carefully compare such field conditions and other information known to the Design-Builder with the Contract Documents before commencing activities.

2-5.7.4 Shop Drawings and Working Drawings, Product Data, and Samples. The Design-Builder shall maintain at the Site for the City one record copy of the Contract Documents, Drawings, Specifications, Addenda, and Construction Documents and any Change Orders thereto in good order and marked to record changes and selections made during the Design Phase and Construction Phase. In addition, the Design-Builder shall maintain at the Site approved Shop Drawings and Working Drawings, product data, samples and similar required submittals.

The Design-Builder shall review and take appropriate action upon Shop Drawings and Working Drawings, product data, samples and similar submittals. The City has determined that it does not wish to review Shop Drawings and Working Drawings, product data, samples and similar submittals. If at a later date, the City wishes to review any such Shop Drawings and Working Drawings, Product Data, Samples and similar Submittals, it will give reasonable prior notice to the Design-Builder, and will conduct such review so as not to delay the Work. The Design-Builder shall provide a register of all Submittals that are scheduled for review by City, designers, or both.

The Design-Builder shall not be relieved of responsibility for the deviations from requirements of the Contract Documents by the City's approval of Shop Drawings and Working Drawings, product Data, samples or similar submittals unless the Design-Builder has specifically informed the City of such deviation at the time of the submittal and the City has given written approval to the specific deviation. The Design-Builder shall not be relieved of responsibility for errors or omissions in Shop Drawings and Working Drawings, product data, samples or similar submittals by the City's approval thereof.

2-6 WORK TO BE DONE. ADD the following:

The City assumes no responsibility for any understanding reached or representation made by any of the City's officers or agents before Award of this contract concerning conditions which could affect the Work, unless that understanding or representation is expressly stated in the Contract Documents.

Where approval or acceptance by the City is required, it is understood to be general approval only and does not relieve the Contractor of responsibility for complying with all applicable laws, codes, and best practices.

ADD the following for Design-Build contracts only:

- a) The minimum design requirements for the Project are set forth in the Bridging Documents, the information provided for sample or model facility, or both. The Design-Builder shall not proceed with design items of Work until the City issues a Design NTP. No payment shall be made for any design items of Work performed prior to issuance of the Design NTP, and applications for payment for such work or services shall not be binding on the City.
- b) For Design-Build contracts, the Contractor shall be responsible for complying with all requirements of the Final Environmental Document, including incorporating environmental

considerations into the Project design, modifying the Project design, where applicable, and mitigating impacts.

- c) The Design-Builder shall schedule, coordinate, and attend a partnership meeting with the Engineer and any other persons deemed appropriate by the City. The partnership meeting shall be held within 15 Working Days after the City issues the Design NTP to discuss roles, responsibilities, lines of communication, and other issues of interest to Parties.
- d) The Design-Builder shall keep the City informed of the progress and quality of the design and construction of the Project.
- e) Organization of the Design Materials into divisions, sections and articles and arrangement of drawings shall not control the Design-Builder in dividing the Construction Work among Subcontractors or in establishing the extent of Construction Work performed by any trade.
- f) **Unless otherwise specified** in the Contract Documents, the Design-Builder shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work, whether temporary or permanent and incorporated in the Work.
- g) The Design-Builder shall respond to, and ensure Subcontractors respond to, RFI, substitution requests, and Change Order requests. The Design-Builder shall provide the City with copies of all correspondence within 24 hours of receipt, and conduct weekly review meetings with the City to discuss these items.

ADD: 2-6.2 Construction Obligations. For Design-Build contracts, the Design-Builder shall not perform any Construction Work in connection with the Project prior to receipt of Construction NTP. No payment shall be made for any Construction Work performed prior to issuance of the Construction Notice to Proceed, and applications for payment for such work shall not be binding on the City.

If the Design-Builder desires to begin constructing a portion of the Project prior to achieving final design of the Project, the Design-Builder shall in writing notify the City at least 3 Working Days in advance of proposed construction activities to seek the City's approval and include proof of receipt of all applicable permits. The City will provide the Design-Builder with a standard form for this purpose. The Design-Builder shall not move forward with any construction activities without providing such notice and receiving the City's approval.

If the Design-Builder desires to modify the design documents after the City's approval thereof, the Design-Builder shall obtain the City's prior written approval before making any such modifications and any construction changes based upon such modifications.

ADD: 2-6.3 Standards of Performance. The Design-Builder shall use the degree of care and skill ordinarily exercised by reputable professionals practicing in the same field of service in the State of California. Where approval or acceptance by the City is required, it is understood to be general approval only and does not relieve the Design-Builder of responsibility for complying with all applicable laws, codes, and good consulting and engineering practices.

The Construction Documents shall be prepared, signed, and stamped by and under the direct responsible charge of an architect or engineer, duly licensed in the State of California. The Work shall be performed in accordance with the professional standards applicable to projects, buildings or work of complexity, quality and scope comparable to the Work of this Project. The Design-Builder shall be the Engineer of Record (Engineer of Work).

ADD: 2-6.4 Use of Design Materials. The City will have unlimited rights to copy and use in connection with the Project all Design Materials, including the right to use same on the Project at no additional cost to the City, regardless of degree of completion, provided that said services performed have been fully paid for, exclusive of amounts disputed by the City in good faith, as required by the terms of this contract.

The Design-Builder agrees to and does hereby grant to the City and any assignee or successor of the City as owner of the Project a royalty-free license to any such Design Materials as to which the Design-Builder may assert any rights under the patent or copyright laws. The Design-Builder hereby agrees to assign outright and exclusively to the City all copyrights in the design appearance of the Project. The Design-Builder, as part of its agreements with any Subcontractor, will secure such license and use rights from each such entity, and shall defend, indemnify and hold the City and any successors or assigns harmless from any claims by such entities for copyright or patent infringement.

ADD: 2-6.5 Local Conditions. The Design-Builder represents that it has taken steps reasonably necessary to ascertain the nature and location of the Work, and that it has investigated and satisfied itself as to the general and local conditions which are applicable to the Work such as (a) conditions bearing on transportation, disposal, handling and storage of materials; (b) the availability of labor, water, power and roads; (c) normal weather conditions; (d) observable physical conditions at the Site; (e) the surface conditions of the ground; and (f) the character of equipment and facilities needed prior to and during the performance of the Work. To the extent the Design-Builder encounters subsurface or concealed conditions which differ materially from those represented in the Contract Documents, then notice by the Design-Builder shall be given to the City promptly before conditions are disturbed and in no event later than 4 Working Days after the first observance of the conditions if a Change Order is contemplated by the Design-Builder due to such condition. Such materially different conditions may entitle the Design-Builder to an adjustment in the Contract Price only for the increased costs of the Work, without markup or fee. If the subsurface or concealed conditions are determined to be of Hazardous Materials or Waste, the Design-Builder shall immediately notify, in no event later than 1 Working Day, the City and proceed as set forth in this subsection and the exhibits of this contract.

The Design-Builder shall not be entitled to any adjustment in Contract Price or Contract Time or will have been deemed to have waived its right to such a Claim if:

- a) The Design-Builder knew of the existence of such conditions at the time the Design-Builder made a final commitment to the City in respect of Contract Price and Contract Time by becoming bound under this contract; or
- b) The existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, of the Site and contiguous areas suggested or required by the Contract Documents; or
- c) The Design-Builder failed to give the written notice within the time and as required by this subsection.

ADD: 2-6.6 Model or Example Facility Information. If any element required by the Contract Documents is not clearly defined, the Design-Builder shall rely on the model or example facility information provided in the Contract Documents for the standard requirements. The City Project Manager shall be contacted for a site visit of facility prior to finalization of Bid.

ADD: 2-6.7 Procedures for Review of Design Materials. The review process for submitted materials will be as follows:

The Engineer will respond to Design-Builder's Submittals or re-Submittals within 15 Working Days of their receipt by the Engineer unless the Engineer gives Design-Builder prior notice. Within 5 Working Days of receipt of the Engineer's comments, Design-Builder will resolve and discuss with the Engineer any outstanding issues as a result of the Engineer's comments. Unless agreed with the Engineer in advance, the Design-Builder will submit any required revised or final Submittals within 10 Working Days of the resolution of the submittal issues.

It is the Design-Builder's responsibility to ensure that the comments of the Engineer are addressed by the designers. One copy of all Submittals reviewed by the designer shall be provided to the Engineer.

2-7 SUBSURFACE DATA. ADD the following:

The Plans show conditions as are believed by the Engineer to exist, but it is not to be inferred that all of the conditions as shown thereon actually exist, nor shall the City or any of its officers be liable for any loss sustained by the Contractor as a result of any variance between conditions as shown on the Plans and the actual conditions revealed during the progress of the Work or otherwise.

If reports of explorations and tests of Site conditions are referenced in the Contract Documents e.g., **Supplementary Special Provisions (SSP)**, the Bidders are encouraged to inspect the Site, acquire, and review these reports and to take other necessary steps to thoroughly familiarize themselves with the Site conditions. If a review of the documents and Site inspection indicate a conflict, the Bidder or the Contractor shall immediately notify the City. For access and cost information to obtain those reports contact the City Project Manager, during City's regular business hours.

The City does not represent that the referenced documents show the conditions that will be encountered in performing the Work. The City represents only that the reports of explorations and tests show the conditions encountered at the particular locations and at the particular times they were obtained. The Bidders and other users of the data are cautioned that interpretations and conclusions contained in the documents were formulated for design purposes only and were based on work performed in such a way as to expressly provide information required for design.

2-10 AUTHORITY OF BOARD AND ENGINEER. ADD the following:

Any plan or method of Work suggested to the Contractor by the City, but not specified or required by this contract, which is adopted or followed by the Contractor in whole or in part, shall be done at the sole risk and responsibility of the Contractor. The City assumes no responsibility and shall not be held liable for any defects in the Work which may result from or be caused by use of such plan or method or Work.

2-11 INSPECTION. ADD the following:

If required by the Engineer, the Contractor shall provide information related to the inspection of the Work. The Contractor shall provide access in accordance with Cal-OSHA Standards where necessary.

The Contractor shall request inspections in accordance with the prevailing Codes and by the City's Development Services Department (DSD). The Contractor shall coordinate these inspections at all times through the Engineer. The Contractor shall remove and replace any items of Work performed without the benefit of the required permit. For required subsequent inspection, the Contractor shall remove and replace Work at the discretion of Engineer at no additional cost to the City. Inspection of the Work shall not relieve the Contractor of the obligation to fulfill all conditions of the Contract.

The Contractor shall give at least 5 Working Days notice for off-site inspection. Notices shall not be deemed effective until the City has responded and agreed to the Contractor's date and time.

The Contractor shall call for, coordinate, and schedule all inspections.

The City will make any inspections and tests as the City deems necessary to ensure the Work is accomplished in accordance with the requirements of the Contract Documents, other than inspections for Work performed in accordance with a permit. The Contractor shall be responsible for inspection of all Work performed in accordance with a permit.

Unless specified otherwise, the Contractor shall pay the cost of inspections and tests. In the event inspections or tests reveal non-compliance with the requirements of the Construction Documents, the Contractor shall bear the cost of any and all corrective measures deemed necessary by the City, as well as the cost of the City's subsequent re-inspection and re-testing.

The City has the right, for a reasonable time, to stop or suspend Work which will cover, and thereby prevent or impede the City's or another agency's ability to inspect, test, or approve a portion of the Work. The Contractor shall have no right to additional costs or time that it may incur as a result of the Work stoppage or suspension.

The Work shall not be covered prior to inspection, testing, or approval required by the Contract Documents, the City's prior written request, or by other agencies. If any item of Work is covered prior to obtaining the required approvals, the Contractor shall, when requested by the City, uncover the Work for inspection, testing, approval, or all. Upon successful completion of the inspection, testing, or approval, the Contractor shall cover the Work where required again. The Contractor shall bear all direct and indirect costs and damages of such uncovering and re-covering and shall not be entitled to an increase in the Contract Price or the Contract Time, unless the Contractor has given the City and any other affected agencies written notice of the Contractor's intention to cover the Work and the City has not acted with in response to such notice.

Tests, inspections, and approvals of items of the Work required by the Contract Documents, Applicable Laws or normal construction practices shall be made at an appropriate time, and in accordance with the Contract Documents. **Unless specified otherwise**, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the City, or with the appropriate public authority, and the costs of such tests, inspections, and approvals shall be included in the Contract Price.

The Contractor shall give the City notice of when and where tests and inspections are to be made so that the City may observe such procedures. Costs of tests, inspections or approvals imposed upon the Contractor by Applicable Laws which do not become requirements until after execution of the Contract shall be an increase to the Contract Price in accordance with Section 3, "CHANGES IN WORK."

Required certificates of testing, inspection or approval shall, **unless specified otherwise** in the Contract Documents, be secured by the Contractor and delivered to the City.

ADD: 2-12 SPECIAL NOTICES. When specified in these Specifications or as directed by the Engineer, any notice required to be given in accordance with this subsection shall be in writing, dated, and signed by the Contractor or Engineer. The notices shall be served by any of the following methods:

- a) Personal delivery with proof of delivery which may be made by declaration under penalty of perjury of any person over the age of eighteen years. The proof of delivery shall show that delivery was done in conformity with this provision; service shall be effective on the date of delivery. Notices given to the Contractor by personal delivery may be made to the Contractor's authorized representative at the Site.

- b) Certified mail addressed to the recipient at the address established for the conduct of the Work under this Contract postage prepaid; return receipt requested; service shall be effective on the date of mailing.

Simultaneously, the City may send the same notice by regular mail. If a notice that is sent by certified mail is returned unsigned, then delivery shall be effective pursuant to regular mail, provided the notice that was sent by regular mail is not returned.

Notice given to the Surety will be addressed to the Surety at the address of the Surety last communicated by to the City.

ADD: 2-13 PARTNERING. The Contractor may request the formation of a Partnering relationship by submitting a request in writing to the Engineer after approval of the Contract. If the Contractor's request for Partnering is approved by the Engineer, scheduling of a Partnering workshop, selecting the Partnering facilitator and workshop, selecting the Partnering facilitator and workshop site, and other administrative details shall be as agreed to by both Parties.

The establishment of a Partnering relationship will not change or modify the terms and conditions of the Contract and will not relieve either party of the legal requirements of the contract.

The goals of partnering shall include:

- a) The Engineer and the Contractor's representatives including Subcontractors actively working together as partners;
- b) Avoidance of destructive confrontation and litigation among the parties;
- c) Mutual understanding on how the Work is to be conducted;
- d) Establishment of mutual key results to facilitate Project success; and,
- e) Establishment of an atmosphere of team work, trust, and open communication.

2-13.1 Payment. The payments involved in providing a facilitator and a workshop site will be borne equally by the City and the Contractor. The Contractor shall pay all compensation for the wages and expenses of the facilitator and of the expenses for obtaining the workshop site. The City's share of such costs will be reimbursed to the Contractor in a Change Order written by the Engineer **unless a Bid item has been established for Partnering**. Markups will not be added. Other costs associated with the Partnering relationship shall be borne separately by the party incurring the costs.

ADD: 2-14 SITE ACTIVITIES BY THE CITY OR SEPARATE CONTRACTORS.

2-14.1 City's Right to Award Separate Contracts. The City reserves the right to perform work or operations outside the scope of Work of this contract related to the Project with the City Forces, Separate Contractors, or both. If Work to be performed by another party was not noted in this contract, the City will give written notice to the Contractor 10 Working Days prior to the start of any work. If the Contractor determines that the work being performed by the City or others may interfere with, or cause damages to Work being performed by the Contractor, the Contractor shall notify the City in writing within 3 Working Days of the City's notice.

2-14.2 Integration of the Work with Separate Contractors. If specified in the Contract Documents, the Contractor shall prepare a plan in order to integrate the work performed by Separate Contractors with the performance of the Work, and shall submit such plan to the City for approval. The plan shall be fair and reasonable for the Contractor and the Separate Contractors, and the Contractor shall work with the Separate Contractors to reach agreement on such plan. The Contractor shall arrange the performance of the Work so that the Work and the work of the Separate Contractors are, to the extent

applicable, properly integrated, jointed in an acceptable manner, and performed in the proper sequence so that any disruption or damage to the Work or to any work of Separate Contractors is avoided.

2-14.3 Coordination. The Contractor shall coordinate its activities and Schedule with the activities and schedules of Separate Contractors and make any revisions to the Schedule deemed necessary.

2-14.4 Use of Site. The Contractor shall afford the City and all Separate Contractors reasonable opportunity for storage of materials and equipment and performance of their work. The Contractor shall connect and coordinate its Work and operations with the City and all Separate Contractors' operations as required by the Contract Documents.

The Contractor shall coordinate traffic control with the Separate Contractors for the other project(s) and shall minimize the impact to the community. Prior to the start of construction the Contractor shall submit its plan for coordination, in accordance with 2-5.3, "Submittals." Payment for coordination shall be included in the various Bid items.

2-14.5 Deficiency in Work of Separate Contractors. If part of the Contractor's Work depends on proper execution or results upon construction or operations by the City or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Separate Contractor and the City apparent discrepancies or defects in such other construction that would render it unsuitable for proper execution and results by the Contractor. The Contractor shall use good faith efforts to resolve any such discrepancies or defects or any disagreements relating thereto. Failure of the Contractor to report shall constitute acceptance by the Contractor of the work of Separate Contractors as fit, proper, and coordinated with the Contractor's Work.

ADD: 2-15 PERSONNEL CHANGES. For Design-Build contracts, the Design-Builder shall ensure that key personnel, as identified in its Proposal, assigned to the Project shall not be replaced or substituted without the prior written approval of the City. The Design-Builder acknowledges that in the event that the Design-Builder fails to staff the Project with the key personnel identified in the Proposal the City will incur substantial damages. The Contractor shall be liable for damages incurred by the City as a result of unauthorized substitution of each key personnel.

The Design-Builder may make such additions or substitutions to other personnel, not identified as key personnel, and responsibilities as it deems necessary or appropriate in order to carry out its responsibilities hereunder, provided such personnel shall be suitably qualified. The City reserves the right to have any Design-Builder's or Subcontractor's employee removed from the Project upon written notice from the City to the Design-Builder without cause.

Nothing contained in the Contract Documents shall create a contractual relationship between the City and any third party, or Subcontractors; however, it is understood and agreed that the City, as the third party beneficiary, is an intended third-party beneficiary of all contracts for design or engineering services, all Subcontracts, purchase orders, and other agreements between the Design-Builder and third parties.

ADD: 2-16 TECHNICAL STUDIES AND DATA. Technical studies (e.g., reports and tests) and data physically included in the Bid package, **referred to in the Special Provisions**, or both show conditions as are believed by the Engineer to exist, but it is not to be inferred that all of the conditions as shown thereon actually exist, nor shall the City or any of its officers be liable for any loss sustained by the Contractor as a result of any variance between conditions indicated in the technical studies and data and the actual conditions revealed during the progress of the Work or otherwise.

The Bidders are encouraged to inspect the Site, acquire, and review this information and to take other necessary steps to thoroughly familiarize themselves with the Site conditions. If a review of the documents and Site inspection indicate a conflict, the Bidder shall immediately notify the City.

The Bidders and other users of the technical studies e.g., reports and data are cautioned that interpretations and conclusions contained in the documents were formulated for design purposes only and were based on work performed in such a way as to expressly provide information required for design **unless specified otherwise**.

Additional exploration may be performed by the Bidders or the Contractor at their own expense.

SECTION 3 – CHANGES IN WORK

3-1.1 General. ADD the following:

The Contract Price shall not be subject to adjustment due to sales tax increases after the award.

ADD the following For GRC contracts only:

The Contractor may request a change in the Task Order price or an extension of time for completion of the Task Order due to changes in the Work that are not within the scope of the Task Order. The request must be in writing and must be submitted to the Engineer prior to beginning the Extra Work. The only City representative authorized to order Extra Work is the Engineer. The Contractor shall not be entitled to compensation for any Extra Work performed unless the Engineer has issued a written Change Order designating (i) the Extra Work to be performed, (ii) the price of the Extra Work, and (iii) the time for completion of the Extra Work. If the City agrees that work is added or deleted, the Task Order price shall be adjusted, using the Procedure for Ordering Work in accordance with 2-1.1.8.1," Procedure for Ordering Work."

ADD: 3-1.3 Cost Reduction Proposal. The Contractor may submit to the Engineer in writing, proposals for modifying the Plans, Specifications, or other requirements of the Contract for the sole purpose of reducing the total cost of construction.

- a) The cost reduction proposal shall not impair, in any manner, the essential functions or characteristics of the Project such as service life, economy of operation, ease of maintenance, desired appearance, or design and safety standards.
- b) Cost reduction proposals shall contain the following information:
 - i. A description of both the existing Contract requirements for performing the Work and the proposed changes.
 - ii. An itemization of the Contract requirements that shall be changed if the proposal is adopted.
 - iii. A detailed estimate of the cost of performing the Work under the existing Contract and under the proposed change.
 - iv. A statement of the time within which the Engineer shall make a decision thereon.
 - v. The Contract items of Work affected by the proposed changes, including any quantity variation attributable thereto.
- c) The provisions of this subsection shall not be construed to require the Engineer to consider any cost reduction proposal which may be submitted hereunder; nor will the City be liable to the Contractor for failure to accept or act upon any cost reduction proposal submitted

pursuant to this subsection, nor for any delays to the Work attributable to any such proposal. If a cost reduction proposal is similar to the information included in the Contract Documents or adopted by the City after the advertisement for the Contract, the City will not accept such proposal and reserves the right to make such changes without compensation to the Contractor under the provisions of this subsection.

- d) The Contractor shall continue to perform the Work in accordance with the requirements of the Contract until an executed Change Order, incorporating the cost reduction proposal has been issued. If an executed Change Order has not been issued by the date upon which the Contractor's cost reduction proposal specified that a decision thereon should be made, or such other date as the Contractor may subsequently have specified in writing, such cost reduction proposal shall be deemed rejected.
- e) The Engineer shall be the sole judge of the acceptability of a cost reduction proposal and of the estimated net savings in construction costs from the adoption of all or any part of such proposal. In determining the estimated net savings, the right is reserved to disregard the Contract Bid prices if, in the judgment of the Engineer, such prices do not represent a fair measure of the value of the Work to be performed or to be deleted.
- f) The City reserves the right, where it deems such action appropriate, to require the Contractor to share in the City's costs of investigating a cost reduction proposal submitted by the Contractor as a condition of considering such proposal. Where such a condition is imposed, the Contractor shall indicate its acceptance thereof in writing, and such acceptance shall constitute full authority for the City to deduct amounts payable to the Contractor from any monies due or that may become due to the Contractor under the Contract.
- g) If the Contractor's cost reduction proposal is accepted in whole or in part, such acceptance will be by a Change Order, which shall specifically state that it is executed pursuant to this subsection. Such Change Order shall incorporate the changes in the Plans and Specifications which are necessary to permit the cost reduction proposal, or such part of it as has been accepted to be put into effect, and shall include any conditions upon which the City's approval thereof is based if the approval of the City is conditional.
- h) The Change Order shall set forth the estimated net savings in the cost of performing the Work attributable to the cost reduction proposal effectuated by the Change Order, and shall further provide that the Contract cost be adjusted by crediting the City with 50% of estimated net savings amount.
- i) Acceptance of the cost reduction proposal and performance of the Work shall not extend the time of completion of the Contract, unless specifically provided for in the Change Order authorizing the use of the cost reduction proposal.
- j) The amount specified to accrue to the Contractor in the Change Order which effectuates a cost reduction proposal shall constitute full compensation to the Contractor for the cost reduction proposal and the performance of the Work thereof pursuant to the said Change Order.
- k) The City expressly reserves the right to adopt a cost reduction proposal for general use on contracts administered by the City when it determines that said proposal is suitable for application to other contracts. When an accepted cost reduction proposal is adopted for general use, only the Contractor who first submitted such proposal will be eligible for compensation pursuant to this subsection, and in that case, only as to those contracts awarded to him prior to submission of the accepted cost reduction proposal.

- l) The cost reduction proposals identical or similar to previously submitted proposals will be eligible for consideration and compensation under the provisions of this subsection, if the identical or similar, previously submitted proposals were not adopted for general application to other contracts administered by the City. Subject to the provisions contained herein, the City or any other public agency shall have the right to use all or any part of any submitted cost reduction proposal without obligation or compensation of any kind to the Contractor.
- m) Additional bonding may be required. The Contractor shall bear all costs to revise bonds for the Project to include the cost reduction incentive proposal Work.

3-2.1 General. ADD the following:

Specific sites for asphalt overlay or concrete ramp and sidewalk replacement may be substituted due to utility or construction conflict, or urgent community needs. The location list provided by the City in the Contract Documents will be adjusted by the City as needed to match the Bid quantities.

For GRC contracts, DELETE the first sentence in its entirety and SUBSTITUTE with the following:

The City may change the Plans, Specifications, or character or quantity of the Work through Change Orders. Should any item of Work be deleted, in part or in its entirety, the reduction in Contract Price shall reflect a credit for the full value of the deleted portion of the Work.

If the City orders work added or deleted, the Task Order price shall be adjusted, using the Procedure for Ordering Work in accordance with 2-1.1.8.1, "Procedure for Ordering Work."

The City will evaluate the entire proposal and proposed Work units and compare these with the City's estimate of the scope of Work to determine the reasonableness of approach, including the nature and number of Work units proposed. The City will determine whether the Contractor's Proposal is in line with its own estimate.

Following agreement on a Non-Prepriced Work unit content and price, the Work unit price will be adjusted to a Work unit base price equivalent to the price of Work units contained in the UPB. Dividing the agreed-upon unit price requirements to be accomplished during Normal Working Hours shall develop this base price.

After using a Non-Prepriced item on three separate Work orders, the unit price for the work item will be negotiated and fixed as a permanent pre-priced item, which will no longer require price justification.

3-2.2.1 General. ADD the following:

Bid unit prices for additional bedding, imported backfill, shoring, water services, house connection sewer, abandoned water services i.e., water stiffes, water pollution control items, point repair for existing sewer main, additional point repair for existing sewer main, sewer lateral connection, and sewer lateral lining shall not be subject to adjustment regardless of quantity used or if none is used.

3-2.3 Stipulated Unit prices. ADD the following: Bid unit prices for additional bedding, imported backfill, shoring, water services, house connection sewer, abandoned water services (water stiffes), and water pollution control items, point repair for existing sewer main, additional point repair for existing sewer main, sewer lateral connection, and sewer lateral lining shall not be subject to adjustment regardless of quantity used or if none is used.

For GRC contracts, ADD the following:

Pre-priced line items on the proposal will identify the division number, item number, page number, item name and quantity of units required from the appropriate UPB indicated in the GRC Contract Documents. The price per unit set forth in the UPB shall serve as the base price for the purpose of the operation of this provision. The Proposal price shall be the sum of the cost of each applicable UPB line item, which is calculated according to the following formula:

A= Number of Units Required for the UPB line item
B= Applicable Adjustment Factor, refer to executed Contract
C= UPB Price per Unit

Total Cost of Pre-Priced Line Item included in Proposal

$A \times B \times C$

Pricing data submitted in support of non-pre-priced line items (NPP) shall include at least two competitive quotes from vendors, suppliers, or subcontractors which will be deemed to be valid for the entire term of the contract. The quotes shall provide an installed unit price (or demolition price if appropriate), which shall include a breakdown including quantities for all labor, materials, services, and equipment required to accomplish the non-pre-priced line item. Contractors may self-perform Non Pre-Priced items of work; however, they still must provide two competitive quotes from outside vendors, suppliers, or subcontractors.

The final price submitted for non pre-priced (NPP) Tasks shall be according to the following formula:

Total Cost of Non Pre-Priced Line Item included in Proposal

A = (Lowest Installed Price) (supported by 2 outside quotes)
B = Applicable Adjustment Factor, refer to executed Contract

Total Cost of Non-Pre-Priced Line Items included in Proposal

$A \times B$

ADD: 3-2.6 Proposal. The post award Contractor's proposal in response to the City's RFP shall be on electronic forms acceptable to the Engineer. The Contractor's proposal shall certify in writing that the amounts included cover all direct, supplemental, indirect, consequential and cumulative costs and delays, as applicable, and that those costs and delays would be or were necessarily incurred, despite the Contractor's reasonable and diligent efforts to mitigate them. Mitigation efforts under taken by the Contractor shall be described.

3-2.6.1 Itemized Proposal, where the change in Contract Price is to be determined on the basis of the "cost of the work involved", the Contractor's itemized estimates shall detail all applicable elements of cost, including, but not limited to, labor hours and payroll costs, quantities, crew mixes, production rates, material costs, Subcontractor and Supplier costs, equipment costs, and supplemental costs. Where the change in Contract Price arises from changes in the schedule of all or part of the Work, or where a change in Contract Time is sought, the submittal shall include analysis required by 6-6.5, "Contract Time Extension and Schedule Analysis" the Contractor Required Analysis.

Subsection 3-2.6.1, "Itemized Proposal" does not apply to GRC contracts.

3-3.1 General. ADD the following:

The City reserves the right to direct the Contractor to solicit competitive Bids for Extra Work. If required by the City, the Contractor shall obtain competitive Bids from Subcontractors acceptable to Contractor and shall deliver such Bids to the City who will then determine which Bids will be accepted.

Any request by the Contractor to change the Contract Price to include the price of Extra Work shall be by written notice to the City and shall include itemized estimates. The Contractor's itemized estimates shall detail all applicable elements of price e.g., labor and payroll costs, quantities, crew composition, production rates, material costs, Subcontractor and Supplier costs, equipment costs, and supplemental costs.

If the Contractor's request to change the Contract Price arises from changes in the Schedule affecting all or part of the Project, or if the Contractor seeks a change in the Contract Time, the Contractor's request shall include the analysis required by 6-1, "CONSTRUCTION SCHEDULE AND COMMENCEMENT OF THE WORK."

3-3.2.1 General. ADD the following:

If shown on the Bid Proposal, the contingency funds including City Contingency and Allowances may be used by the Design-Builder with the City's prior approval. The contingency funds will be available to provide additional funds for Extra Work. The contingency funds will not be available for:

- a) work required due to the Design-Builder's, its officers', agents', or employees' failure to perform Work or Services according to the terms of this contract; or
- b) uninsured losses resulting from the negligence of the Design-Builder, its officers, agents, or employees. The City reserves the right to seek reimbursement for any costs expended due to errors or omissions of the Design-Builder's officers, agents, or employees providing Services to the Project.

100% of unused portions of the City Contingency and Allowances shall revert to the City upon Acceptance.

3-3.2.2 Basis for Establishing Costs.

- a) Labor: DELETE in its entirety and SUBSTITUTE with the following:

The Engineer reserves the right to request certified payrolls to substantiate the actual cost of labor on City provided form attached to this contract **as an Appendix**. An initial submittal shall be made prior to NTP. The Bid item for Certified Payroll shall include payment for producing payroll certified by a California licensed Certified Public Accountant and shall be paid for on a per each basis. The certified payroll shall list the labor rates of the Contractor personnel, consultants and Subcontractors that are working on or are associated with this Project and shall be provided at the request of the Engineer.

Prior to NTP an initial submittal identifying employees and the labor costs shall be made on the City provided form attached to this contract **as an Appendix**.

If the Contractor's proposal for Extra Work is based upon services and work to be performed outside Normal Working Hours, the labor charges associated with such Extra Work shall consist of straight time wages and burden plus the appropriate overtime or shift premium with no additional burden (i.e., fringe benefits) on the premium portion.

In no case shall the Contractor be required to pay more than state and or federal wage rates, whichever governs the Work or any portions thereof.

c) Tool and Equipment Rental: DELETE second paragraph in its entirety, and SUBSTITUTE with the following:

Regardless of ownership, the rates to be used in determining equipment rental costs shall not exceed those listed in the latest edition of the Caltrans publication entitled "Labor Surcharge and Equipment Rental Rates" preceding the date the Work is accomplished. Where the Contractor can substantiate that the rental rates prevailing locally exceed the published rates by more than 15%, the Contractor will be entitled to a rental rate adjustment. For equipment not listed in said publication, rental rates shall not exceed listed rates prevailing locally at equipment rental agencies or distributors, at the time the Work is performed.

Whenever possible, Extra Work shall be accomplished using equipment available on Site or owned by the Contractor. If a specific piece of equipment must be rented to be used exclusively for the Extra Work, the rental rate will be the invoiced rate.

3-3.2.3 Markup. DELETE in its entirety and SUBSTITUTE with the following:

For Change Orders, whether additive or deductive, and work classified as Extra Work the allowance for overhead and profit shall include full compensation for superintendence, insurance premiums, taxes, field office expense, extended overhead, home office overhead, and any other items of expense e.g., Change Order estimating and preparation cost, claims preparation cost, schedule analysis, project management, and field engineering.

Extended overhead shall be any and all costs incurred either in the field or at the Contractor's office resulting from Extra Work excluding direct costs related to direct hourly labor, equipment, or materials necessary to complete the Extra Work.

- a) The allowance for overhead and profit shall not exceed the values in Table 3-2.2.3(A) **unless specified otherwise** in the Special Provisions.

Table 3-2.2.3(A)

Component	Overhead	Profit
Labor	10%	10%
Material	10%	5%
Equipment	10%	5%

- b) To the sum of the costs and markups provided for in this subsection, actual increase in the Contractor's bond premium caused by the Extra Work shall be added as compensation for Bonds.
- c) Work paid under Allowance Bid items for permits, governmental fees, or direct payments specified in the Contract Documents will not be subject to markup **unless specified otherwise** in the Special Provisions.
- d) When all or any part of the Extra Work is performed by a Subcontractor, the allowance specified herein shall be applied to the labor, materials, and equipment costs of the Subcontractor, to which the Contractor may add 5% of the Subcontractor's total cost for the Extra Work.

Regardless of the number of hierarchical tiers of Subcontractors, the 5% which is the Contractor's allowance 3.5% (for overhead) and 1.5% (for profit) may be applied one time only to the performing Subcontractor's total cost.

- e) The Contractor shall only be reimbursed, with 6% markup, for the warranty extensions beyond the time required by the Contract Documents if requested by the City.

ADD: 3-4.1 Disallowance of Entitlement. The Contractor shall not be entitled to any adjustment in the Contract Price or Contract Time if:

- a) The Contractor knew of the existence of such conditions at the time the Contractor made a final commitment to the City in respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
- b) The existence of such condition could reasonably have been discovered or revealed as a result of any record search, examination, investigation, exploration, test or study of the Site and contiguous areas suggested or required by the Bidding Documents.

ADD: 3-6 DISPUTE RESOLUTION PROCESS.

3-6.1 Mandatory Non-Binding Mediation. If a dispute arises out of, or relates to this contract, or the breach thereof, and if said dispute cannot be settled through contract provisions provided for claim settlement or negotiations, the parties agree to first endeavor to settle the dispute in an amicable manner, using mandatory mediation under the Construction Industry Mediation Rules of the American Arbitration Association or any other neutral organization agreed upon before having recourse in a court of law.

3-6.1.1 Mandatory Mediation Costs. The expenses of witnesses for either side shall be paid by the party producing such witnesses. All other expenses of the mediation, including required traveling and other expenses of the mediator, and the cost of any proofs or expert advice produced at the direct request of the mediator, shall be borne equally by the parties, unless they agree otherwise.

3-6.1.2 Selection of Mediator. A single mediator that is acceptable to both parties shall be used to mediate the dispute. The mediator will be knowledgeable in construction aspects and may be selected from lists furnished by the American Arbitration Association (AAA) or any other agreed upon mediator. To initiate mediation, the initiating party shall serve a Request for Mediation on the opposing party. If the mediator is selected from a list provided by AAA, the initiating party shall concurrently file with AAA a "Request for Mediation" along with the appropriate fees; a copy of requested mediators marked in preference order, and, a preference for available dates.

If AAA is selected to coordinate the mediation (Administrator), within 10 Working Days from the receipt of the initiating party's Request for Mediation, the opposing party shall file the following: a copy of the list of the preferred mediators listed in preference order, after striking any mediators to which they have any factual objection, and, a preference for available dates. If the parties agree not to use AAA, then a mutually agreed upon mediator, date and place for the mediation shall be agreed upon.

The Administrator will appoint or the parties shall agree upon the highest, mutually preferred, Mediator from the individual parties' lists who is available to serve within the designated time frames.

3-6.1.3 Conduct of Mediation Sessions. Mediation hearings will be conducted in an informal manner and discovery will not be allowed.

The discussions, statements, or admissions will be confidential to the proceedings and will not be used for any other purpose as it relates to the party's legal position. The parties may agree to exchange any information they deem necessary.

Both parties shall have an authorized representative attend the mediation. Each representative shall have the authority to recommend entering into a settlement. Either party may have attorney(s),

witnesses or expert(s) present. Either party may request a list of witnesses and notification whether attorney(s) will be present.

Any resultant agreements from mediation shall be documented in writing. Mediation results and documentation, by themselves, shall be "non-binding" and inadmissible for any purpose in any legal proceeding, unless such admission is otherwise agreed upon, in writing, by both parties. Mediators shall not be subject to any subpoena or liability and their actions shall not be subject to discovery.

ADD: 3-6.2 Dispute Resolution Board. If mediation is unsuccessful in settling the dispute and if both parties agree, a no mandatory dispute resolution board process may be used. The parties may impanel a Dispute Resolution Board (DRB) and the DRB process shall be conducted in accordance with the City's alternative dispute resolution process, utilizing board members who are individuals who have expertise in construction. The selection process shall be administered by the American Arbitration Association, or any other such neutral organization selected by the City, hereinafter called the "Administrator". Claims made for \$60,000 or less shall be heard by 1 DRB member and claims for more than \$60,000 shall be heard by 3 DRB members.

To initiate the DRB procedures, the parties shall jointly execute and file a "Submission to Dispute Resolution Board Procedures" request with the Administrator. Upon receipt by the Administrator of the submission form, the Administrator shall furnish to the parties a list of individuals skilled in dispute resolution and having expertise in construction from which to select the Dispute Resolution Board. Within 10 Working Days from the date the list is sent to the parties, the parties shall return the list to the Administrator, striking any individuals to which the parties have any factual objections and numbering the remaining in preference order. The Administrator shall appoint the highest mutually preferred individuals to the DRB that are available to serve in the time frame designated above.

3-6.2.1 Dispute Resolution Board Costs. The costs for DRB hearings and proceedings, which include those of either the 1 person or 3 person boards hearing the dispute, will be shared equally by both parties. Fees shall be jointly negotiated by both parties directly with the DRB Administrator.

3-6.2.2 Conduct of Dispute Resolution Board Hearings. DRB hearings shall be informal and discovery shall not be permitted. The parties may agree to exchange any information they deem necessary. Each party shall have a maximum of 2 hours for presentation, unless otherwise agreed upon. Outside experts, including attorneys, may address their specialty if the opposing party is notified in advance. Each party will be given full opportunity to present its views and supporting information, including documents, drawings, or other pertinent material. All such evidence and displays shall be considered confidential and shall be retained by the presenting party. Discussions or admissions during DRB discussions shall be considered as part of privileged settlement discussions, without prejudice to any party's legal position.

Any resultant agreements from a DRB Hearing shall be documented, in writing, by both parties. The DRB results and documentation, by themselves, shall be non-binding and inadmissible for any purpose in any legal proceeding, unless such admission is otherwise agreed upon, in writing, by both parties. DRB members shall not be subject to any subpoena or liability and their actions shall not be subject to discovery.

Within 10 Working Days after the hearing, the DRB will make its recommendation, in writing, for resolution of the dispute to all parties. The DRB will strive for consensus and unanimity in its decision making. If such is unattainable, however, separate written recommendations may be made as majority or minority reports.

ADD: 3-7 CLAIMS. Claim is a written demand by the Contractor that seeks an adjustment in the Contract Price or the Contract Time, or other relief associated with a dispute arising under or relating to the Contract, including a breach of any provision thereof. A voucher, invoice, or other routine request for payment is not a Claim.

A Claim shall conform to these specifications and may be considered after the City has previously denied a request by the Contractor for a Change Order seeking the demanded relief.

The Contractor shall submit a Claim to the City if a dispute occurs that arises from or relates to the Contract. The Claim shall seek all relief to which the Contractor asserts it is entitled as a result of the event(s) giving rise to the dispute. The Contractor shall substantiate Claims, and shall process Claims in accordance with this subsection. The Contractor's failure to process a Claim in accordance with this subsection shall constitute a waiver of all relief associated with the dispute. Claims shall be subject to 6-11, "CITY'S RIGHT TO AUDIT."

Contractor shall continue to perform the Services and the Work and maintain the Schedule during any dispute proceedings and City will continue to make payments for undisputed Services and Work.

A claim arising under the Contract, unlike a claim relating to the Contract, is a claim that can be resolved under a Contract provision that provides for or excludes the relief sought by the claimant. Such claims shall be resolved under the applicable provisions of the Contract.

The City's claims process in this subsection shall not relieve Contractor of his statutory obligations to present claims prior to any action under the California Government Code.

3-7.1 Time of Claim. The Contractor shall promptly, but in no event later than 30 days after the event(s) giving rise to the claim, deliver the claim to the City. The Contractor shall not process a claim unless the City has previously denied a request by the Contractor for a Change Order that sought the relief to be pursued in the claim.

3-7.2 Claim Certification Requirements. If the claim seeks an increase in the Contract Price, the Contract Time, or both, the Contractor shall submit with the claim an affidavit certifying that:

- a) The claim is made in good faith and covers all costs and delays to which the Contractor is entitled as a result of the event(s) giving rise to the claim;
- b) The amount claimed accurately reflects the adjustments in the Contract Price, the Contract Time, or both to which the Contractor believes it is entitled; and
- c) All supporting costs and pricing data are current, accurate, complete, and represent the best of the Contractor's knowledge and belief.

The Contractor shall ensure that the affidavit is executed by an official who has the authority to legally bind Contractor.

3-7.3 Claim Resolution Process. The Contractor shall submit claim certification and request for a settlement meeting and the City's Determination to the Engineer within 20 Working Days of receipt of the Engineer's initial determination.

3-7.4 Initial Determination. Initial Determination is the City's written approval or non-approval of a Claim from the Contractor. Within 30 days of receipt of a Claim, the City will deliver an Initial Determination to the Contractor. The City will not consider and will return to the Contractor any written demand that does not conform to the requirements of 3-7, "CLAIMS."

3-7.5 Final Determination. If the Contractor disagrees with the Initial Determination, the Contractor may request a Final Determination. The Contractor's request shall be in writing and shall be delivered to the City within 30 days of the date of the Initial Determination. The City will deliver a Final Determination to the Contractor within 30 days after receipt of the Contractor's written request. Final Determination is the City's final written decision on the Contractor's appeal of the City's Initial Determination on the Contractor's Claim.

3-7.6 Settlement Meeting. Within 15 Working Days of receipt of the Contractor's request for a "Settlement Meeting", the Engineer will schedule a "Settlement Meeting" between the Contractor's representative, the City's representative, and the Engineer. This meeting will be an opportunity for the Contractor to explain its claim to senior management of the City. If a settlement agreement cannot be reached, the Engineer and the City will proceed to make a joint written determination.

3-7.7 City's Determination. The City will make a written determination within 20 Working Days after the settlement meeting. The written determination shall be final and binding on the Contractor unless the Contractor notifies the City and the Engineer in writing of its objection within 15 Working Days after receipt of the written determination, and files a "Request for Mediation" in accordance with 3-6, "DISPUTE RESOLUTION PROCEDURES." Failure to give notice of objection within said 15 Working Days period shall be deemed to be a waiver of its right to pursue the claim.

3-7.8 Mandatory Assistance. If a third party dispute or litigation, or both, arises out of, or relates in any way to the Services provided under this contract, upon the City's request, the Contractor agrees to assist in resolving the dispute or litigation. The Contractor assistance includes, but is not limited to, providing professional consultations, attending mediations, arbitrations, depositions, trials or any event related to the dispute resolution, litigation, or both.

3-7.8.1 Attorney Fees Related To Mandatory Assistance. In providing the City with dispute or litigation assistance, the Contractor and or Subcontractors or their agents, officers, and employees may incur expenses and or costs. The Contractor agrees that any attorney fees it may incur are not reimbursable.

3-7.8.2 Compensation for Mandatory Assistance. The City will reimburse the Contractor for reasonable fees and expenses incurred by the Contractor for any required assistance rendered in accordance with 3-7.8, "Mandatory Assistance" as Extra Work. The City in its sole discretion shall determine whether these fees and expenses were necessary due to the conduct of or failure to act by the Contractor or Subcontractors or their respective agents, officers, and employees. If the City determines that the basis of the dispute or litigation in which these fees and expenses were incurred were the result of the conduct of or failure to act by the Contractor or Subcontractors or their respective agents, officers, and employees, in part or in whole, the City shall be entitled to be reimbursed for any payments made for these fees and expenses.

Reimbursement may be through any legal means necessary, including the City's withholding of payment.

3-7.9 Costs Relating To Weather Damage. The Contractor shall have no claims against the City for damages for any injury to Work, resulting from the action of the elements or weather. If, however, in the opinion of the Engineer, the Contractor has made all reasonable efforts to protect the Work, the Contractor may be granted a reasonable extension of Contract Time to make proper repairs, renewals, and replacements of Work in accordance with Section 6, "PROSECUTION, PROGRESS, AND ACCEPTANCE OF THE WORK."

ADD: 3-9 ADDITIONAL COSTS. For Design-Build contracts, additional costs are those costs that can be reasonably determined to be related to the Design-Builder's errors or omissions, and may include the Design-Builder, the City, or Subcontractors' overhead, construction, materials, demolition, and related costs. The Design-Builder shall not be paid for Work or Services required due to the Design-Builder's errors or omissions, and the Design-Builder shall be responsible for any additional costs associated with such errors or omissions. The Design-Builder shall reimburse the City for additional costs due to the Design-Builder's errors or omissions.

ADD: 3-10 ADDITIONAL SERVICES. For Design-Build contracts, the City has the right to direct Design-Builder to perform additional services beyond those Services detailed in the Scope of Work and Services (Additional Services).

- a) The Design-Builder shall promptly perform any Additional Services as directed by the City in accordance with the Contract Documents. The Design-Builder shall request a Change Order when seeking reimbursement for Additional Services requested by the City.
- b) If at any time Design-Builder contends that the City is asking the Design-Builder to perform Additional Services which are not specifically identified as such by the City, the Design-Builder shall immediately (within 24 hours) give the City written notice prior to performing the Services in question. The notice shall state that the Design-Builder intends to seek additional compensation beyond the amount specified in the Bid. Furnishing timely, accurate, advance written notice shall be a condition precedent to the Design-Builder's ability to seek additional compensation from the City.
- c) The Design-Builder shall not perform, and shall not be entitled to compensation for, any Additional Services unless the City has, in advance, authorized in writing performance of the Additional Service. Under no circumstances shall Design-Builder be paid for Additional Costs.
- d) The Design-Builder's Compensation Rate Schedule for design professional is attached to this contract. Payment for any Additional Services shall be in accordance with the Compensation Rate Schedule, and no increases to the Compensation Rate Schedule may be made during the Contract Time.
- e) The Design-Builder shall separately submit to the City a certificate and application for monthly payment of any authorized Additional Services. No markup will be allowed for the Design-Builder and its agents for Additional Services.

SECTION 4 – CONTROL OF MATERIALS

4-1.3.1 General. ADD the following:

Location changes to the source of materials requiring inspection without the required 24 hour notification may result in non-compliant material subject to rejection. A deductive Field Order will be issued to reimburse the City for misdirected staff charges. For private contracts, the permittee will be notified in writing of the additional staff charges incurred.

4-1.3.2 Inspection of Material Not Locally Produced. DELETE in its entirety and SUBSTITUTE with the following:

When the Contractor intends to purchase materials, fabricated products, or equipment from sources located more than 50 miles outside the geographical limits of the City or outside the U.S.A., an inspector or accredited testing laboratory (either from City's approved construction materials testing laboratories and inspection agencies list or approved by the Engineer), shall be engaged by the Contractor at its expense, to inspect the materials, equipment or process. This approval shall be obtained before producing any material or equipment. The inspector or representative of the testing

laboratory shall evaluate the materials for conformance with the requirements of the Plans and Specifications. The Contractor shall forward reports required by the Engineer.

No materials or equipment shall be shipped nor shall any processing, fabrication or treatment of such materials be done without proper inspection by the approved agent. Approval by said agent shall not relieve the Contractor of responsibility for complying with the requirements of the Contract Documents.

When specified in the Special Provisions or as noted on the Plans, the Engineer may elect to perform inspection of an out-of-town manufacturer. The Contractor shall incur all inspection costs. These costs shall include travel expenses, a per diem allowance for lodging, meals, car rental per day. If the manufacturing plant operates a double shift, a double shift shall be figured in the inspection costs. At the option of the Engineer, full time inspection will continue for the length of the manufacturing period. If the manufacturing period will exceed 3 consecutive weeks, the expenses of the Engineer's supervisor will be included in the figures for one 2-day trip to the site per month. Inspection costs paid by the Contractor will not include the wages of the Engineer and their supervisor if employed by the City, **when required in the Special Provisions or as shown on Plans**.

When specified in the Special Provisions or as noted on the Plans, the Engineer may elect to perform inspection of an out-of-town manufacturer. The Contractor shall incur all inspection costs. These costs shall include travel expenses, a per diem allowance for lodging, meals, and car rental per day. If the manufacturing plant operates a double shift, a double shift shall be figured in the inspection costs. At the option of the Engineer, full time inspection will continue for the length of the manufacturing period. If the manufacturing period will exceed 3 consecutive weeks, the expenses of the Engineer's supervisor will be included in the figures for one 2-day trip to the site per month. Inspection costs paid by the Contractor will not include the wages of the Engineer and their supervisor if employed by the City, **when required** by the Special Provisions or as shown on Plans.

4-1.3.3 Inspection by the Agency. DELETE in its entirety and SUBSTITUTE with the following:

The Agency will provide all inspection and testing laboratory services within 50 miles (80 km) of the geographical limits of the Agency within the U.S.A. For Private Contracts, all costs of inspection at the source, including salaries and mileage costs, shall be paid by the permittee.

ADD: 4-1.3.4 Inspection Paid For By the Contractor. The Contractor shall employ and pay for the services of a qualified inspection agency to perform **specialty inspection services as required by the Contract Documents**.

If no Bid item is provided, payment shall be included in various Bid items.

ADD: 4-1.3.5 Special Inspection. Special inspection and testing by the Special Inspectors shall meet the minimum requirements of the building codes specified in the Contract Documents.

Each Special Inspector shall be certified by the City's Development Services Department (DSD) prior to performing any duties. Special Inspectors shall carry approved identification, as stipulated by the DSD, when performing the function of a Special Inspector.

a) Contractor Responsibilities:

- i. The Contractor shall notify the Special Inspector prior to performing any item of Work that requires Special Inspection and shall review the Contract Documents and perform any necessary preparatory Work at the Site.
- ii. The Contractor is responsible for providing the Special Inspector access to approved Drawings and Specifications at the Project's Site.

- iii. The Contractor shall be responsible for retaining at the Site all Special Inspection records submitted by the Special Inspector and providing these records for review by the Development Services Department inspector upon request.
 - iv. The Contractor shall not perform any items of Work that requires Special Inspection without the presence of the Special Inspector/s during the performance of that Work. Work requiring continuous inspection performed without Special Inspection shall be subject to removal.
 - v. The Contractor shall employ a sufficient number of Special Inspectors to assure inspection of all Work requiring Special Inspection without hindering the progress of the Work.
 - vi. Special Inspector shall comply with all requirements of the Development Services Department and the building permit.
 - vii. Upon completion of task requiring Special Inspection, the Contractor shall submit to the Engineer all Special Inspection reports that certify that the Work requiring Special Inspection has been completed in accordance with the Contract Documents and the applicable building codes and approved by the Engineer and DSD.
- b) Duties and responsibilities of the Special Inspector. The Contractor shall ensure the following requirements are met by the Special Inspectors employed by the Contractor. The Special Inspector is not authorized to do any of the following:
- i. To inspect or approve any items of Work for which the building permit has not been issued;
 - ii. To inspect or approve any items of Work before the DSD has made the initial inspection. Deviations from this procedure shall be requested in writing from the DSD;
 - iii. To inspect or approve any items of Work other than that for which they are specifically certified;
 - iv. To accept alternate materials, structural changes, or revisions to Drawings.
 - v. Observe Work: The Special Inspector shall observe the Work for conformance with the DSD approved design Drawings and Specifications. Shop Drawings, Working Drawings, or both may be used only as an aid to inspection. Special Inspections are to be performed on a continuous basis, meaning that the Special Inspector is on site at all times observing the Work requiring Special Inspection.

Periodic inspections, if any, shall have prior approval by the DSD based on a separate written plan prepared by the Contractor and reviewed and approved by the DSD and the Engineer.

- vi. The Special Inspector shall bring nonconforming items to the immediate attention of the Contractor and note all such items in the daily report. If any item is not resolved in a timely manner or is about to be incorporated in the Work the Special Inspector shall immediately notify the DSD (by telephone or in person), notify the Engineer, and post a discrepancy notice.
- vii. Furnish Daily Reports: On request, each Special Inspector shall complete and sign both the Special Inspection record and the daily report form for each daily inspection to remain at the Site with the Contractor for review by the Engineer, DSD's inspector.

- viii. The Special Inspector or inspection agency shall furnish weekly reports of tests and inspections directly to the Engineer, DSD and others as designated on the plans, permits or herein. These reports shall include the following:
 - 1. Description of daily inspections and tests made with applicable locations;
 - 2. Listing of all nonconforming items;
 - 3. Report on how nonconforming items were resolved or unresolved as applicable; and
 - 4. Itemized changes authorized by the Engineer and DSD if not included in nonconformance items.
- ix. The Special Inspector shall submit a final signed report to the Engineer and DSD stating that Work requiring Special Inspection and testing were inspected, tested and reported, and to the best of Special Inspector's knowledge, is in conformance with the approved drawings and Contract Documents, approved revisions and the applicable workmanship provisions of the building codes whichever is in effect on the permitted Plans. Items not in conformance, unresolved items or any discrepancies in inspection coverage (i.e., missed inspections, periodic inspections when continuous was required, etc.) shall be specifically itemized in this report. Final inspection of the structure will not be scheduled until the final report for all Work items requiring Special Inspection have been reviewed and approved by the Engineer and DSD.

ADD: 4-1.3.6 Preapproved Materials. Materials such as concrete, asphalt concrete, slurry, backfill and bedding, gravel, crushed rock, and other materials that are not produced or delivered until the day they are used, do not require a submittal if they are determined by the Engineer to be standard materials provided in conformance with Part 2, "Construction Materials", Part 4, "Rock Products" and Part 5, "System Rehabilitation" **unless specified otherwise.**

For materials listed on the City's Approved Materials List (AML), in lieu of the submittal, the Contractor shall certify in writing, that the proposed equipment and material to be incorporated in the Work comply with the Contract requirements and AML.

4-1.4 Test of Materials. ADD the following:

Third party independent testing and quality control testing shall be performed by professionals with credentials and certifications traceable in the United States.

4-1.5 Certificate of Compliance. DELETE in its entirety and SUBSTITUTE with the following:

The Engineer may waive the materials testing requirements of the Specifications and accept a Certificate of Compliance. Manufacturing quality control test data may be required by the Engineer to be included with the Certificate of Compliance.

Approval to issue a Certificate of Compliance in lieu of testing shall be obtained when specified or prior to the use of any material or assembled material for which these specifications or the Special Provisions require materials testing. Certificate of Compliance shall clearly identify each lot it applies to and provide an explanation of code and date markings on the product.

Materials or assembled materials used on the basis of a Certificate of Compliance shall remain subject to Specifications and as such may be sampled and tested at any time. Materials or assembled materials not conforming to the Specifications will be subject to rejection whether in place or not.

The form of the Certificate of Compliance and its disposition shall be as directed by the Engineer.

4-1.6 Trade Names or Equals. ADD the following:

The Contractor shall submit its list of proposed substitutions for “an equal” (“or equal”) item(s) within 35 days after the award of the Contract.

Substitution requests shall clearly indicate deviations from the equipment and materials specified in the Contract Documents.

If an offered substitution by the Contractor for the trade names specified in the Contract necessitates changes to, or coordination with, other items of the Work, the information submitted shall include details showing such changes. The Contractor shall perform these changes as part of the substitution of material or equipment and at no additional cost to the City.

If the Engineer takes no exceptions to the proposed substitution, it shall not relieve the Contractor from responsibility for the efficiency, sufficiency, quality, and performance of the substitute material or equipment, in the same manner and degree as the material and equipment specified by name.

There is no guaranteed time frame for completion of product substitution review as much of the information on criteria such as long term testing, service, and durability may not be readily available.

The lack of action(s) on the Engineer’s side within the Contractor’s requested time shall not constitute acceptance of the substitution.

For the substitution review process or to have materials listed on the AML, refer to the AML standard review process.

The Bid submittal shall be based on the material and equipment specified by name in the Contract or approved equal.

If the proposal is rejected or approved by the Engineer, the Contractor shall not be entitled to an extension in Contract Time, increase in the Contract Price, or both.

For Design-Build contracts, one copy of all designer reviewed submittals shall be provided to the City.

ADD: 4-1.10 Foreign Materials. Materials that are manufactured, produced, or fabricated outside of the United States shall be delivered to a distribution point in California, unless otherwise specified in these Specifications or the Special Provisions. The materials shall be retained for a sufficient period of time to permit inspection, sampling, and testing.

The Contractor shall not be entitled to an extension of time for acts or events occurring outside of, at point of entry, or during transport to the United States.

SECTION 5 - UTILITIES

5-1 LOCATION. ADD the following:

The City does not warrant the accuracy or completeness of the location and type of existing utilities and substructures shown on the Plans. The Contractor is responsible to accurately locate, by potholing or other suitable methods, all existing utilities such as service connections and substructures as shown

on the Plans and marked out by Underground Service Alert (USA), to prevent damage to such facilities and to identify any conflicts with the proposed work.

The Contractor shall fill all potholes on the same day of excavation, and, if no trenching is performed within 10 Working Days, fully restore all potholes and any damaged surrounding areas to their original condition unless otherwise allowed by the Engineer.

There will be no other compensation for potholing at any specific location required by the Plans. Neither will showing some specific locations on the Plans relieve the Contractor of the responsibility to pothole as previously mentioned in this Subsection.

The Contractor shall notify the Engineer, in writing, of any conflicts between existing utilities and the proposed work a minimum of 5 Working Days, and 300' in advance of the work to provide adequate time, and space for any changes to the work needed to avoid unforeseen conflicts. The Contractor shall perform utility location far enough in advance of the Work to provide the written notification specified in this subsection.

The written notification shall include; date of utility location, method of utility location, type, size, and material of utility, horizontal location (to the nearest Station), depth for existing pavement or ground surface to top and bottom of utility, suspected ownership of utility, and the date on which any conflict with the utility will impact the critical path(s).

For existing utilities shown on the Plans or marked out by USA, the Contractor shall not be entitled to an extension of Contract Time or compensation for delay if direction is provided by the Engineer within 5 Working Days from receipt of the Contractor's written notification of the utility conflict. If the Engineer does not provide direction to the Contractor within the 5 Working Days, an extension of Contract Time may be granted in accordance with Section 6, beginning on the sixth Working Day after receipt of the Contractor's written notification.

The Contractor shall locate and reconnect all House Connection Sewers. Locations as shown on the Plans are approximate only. House Connections Sewer records are available at the Public Utilities Department, 2797 Caminito Chollas.

The locations of existing buildings as shown on the Plans are approximate.

Unless specified otherwise as previously potholed, elevations shown on the Plans for existing utilities are based on a search of record information available during design only and are solely for the Contractor's convenience. The City does not guarantee the accuracy of the elevations.

The Contractor shall notify the Engineer immediately if:

- a) 1' vertical separation as measured from outside pipe wall to outside pipe wall between sewer and water mains cannot be maintained.
- b) 4' horizontal separation as measured from outside pipe wall to outside pipe wall between sewer and water mains cannot be maintained.
- c) 6" vertical separation as measured from outside pipe wall to outside pipe wall between utilities other than sewer and water mains cannot be maintained.
- d) 3' or more cover over top of water main cannot be maintained.
- e) 5' or more cover over top of recycled water main cannot be maintained.

For Design-Build contracts, ADD the following:

The Design-Builder shall coordinate review of the Project design drawings by the utility agencies at the time of the Design-Builder's 60% design submittal. The Design-Builder shall determine locations and elevations of all active and abandoned underground utilities in the Project area that may affect Project construction activities. The Design-Builder shall provide all required information for the construction or

relocation of all public or private utilities that shall be constructed or relocated as a result of this Project. The Design-Builder shall provide designs for wet utility crossings. The Design-Builder shall coordinate utility facility and equipment shutdown requirements with the Engineer.

If an underground utility is uncovered or revealed at or contiguous to the Site which was not indicated in the Contract Documents and which the Design-Builder could not reasonably have been expected to be aware of, the Design-Builder shall identify the utility owner of such underground utility and give written notice thereof to that utility owner and the City.

When the Construction Documents provide for the Design-Builder to alter, relocate, or reconstruct a utility, temporary or permanent relocation or alteration of indicated utilities requested by the Design-Builder for its convenience shall be its responsibility, and the Design-Builder shall make all arrangements.

Nothing herein shall be deemed to require the City to indicate the presence of existing service laterals or appurtenances when the presence of such utilities on the Project Site can be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes, on or adjacent to the site of construction.

5-4 RELOCATION. For Design-Build contracts, DELETE the second paragraph and SUBSTITUTE with the following:

The Design-Builder shall alter, relocate, and reconstruct all utilities, including water and sewer connections, as necessary to construct the Project. Utilities not indicated on Design-Builder's Plans that are found to interfere with the Work shall be relocated, altered, or reconstructed by the utility owner, or by Design-Builder, at no additional cost to City. The Design-Builder shall contact and coordinate alteration, relocation, or reconstruction of gas, electric, cable, and telephone service connections with the owner of those utilities.

5-5 DELAYS. For Design-Build contracts, ADD the following:

The Design-Builder shall not be entitled to an extension of the Contract Time or to compensation for Extra Work or delay attributable to utility or substructure relocations or alterations when the existing utilities or substructures were:

- a) identified in the Contract Documents, utility records, as-built and record drawings, or other relevant records and archives pertaining to utility locations that the Design-Builder could reasonably have been expected to be aware of; or
- b) marked out by USA.

ADD: 5-7 Payment. **Unless specified otherwise** in the Contract Documents, payment for items of Work related to Utilities shall be included in the various Bid items.

Potholing of existing utilities as shown on the Plans and performed for the tunneling of the replumbs shall be included in the payment for replumbing.

Potholing for existing utilities which are not shown on the Plans, but marked out by USA shall be as directed by the Engineer and paid as Extra Work.

SECTION 6 – PROSECUTION, PROGRESS, AND ACCEPTANCE OF WORK

6-1.1 Construction Schedule. ADD the following:

- a) The Contractor shall be responsible for developing, coordinating, revising, updating, and maintaining the cost loaded construction schedule (Schedule) utilizing the Critical Path Method (CPM).
- b) Schedule versions shall be based solely on the Work as awarded, and shall exclude any substitute proposals even if the Contractor pursues a substitution in accordance with provisions of the Contract.
- c) The approved proposals and approved Change Orders shall be included in the Schedule updates.
- d) Total float is the number of days by which a part of the Work in the Schedule may be delayed from its early dates without necessarily extending the Contract Time. The Contract float is the number of days between the Contractor's anticipated date for early completion of the Work, or specified part, and the corresponding Contract Time. Total float and Contract Time float belong to the Project and are not for the exclusive benefit of any Party. They shall be available to the City or the Contractor to accommodate changes in the Work or to mitigate the effect of events which may delay performance or completion.
- e) Monthly progress payments are contingent upon the submittal of an updated Schedule to the Engineer. The City may refuse to recommend the whole or part of any monthly payment if, in the Engineer's opinion, the Contractor's failure, or refusal to provide the required Schedule information precludes a proper evaluation of the Contractor's ability to complete Project within the Contract Time.
- f) The Schedule shall show a breakdown of Work into activities and relationships to the extent required to effectively manage the Work. The Schedule shall show the division of the Work into activities and specify the progression from the Notice to Proceed (NTP) to the end of the Contract Time.
- g) The Schedule shall include appropriate time allowances and constraints for submittals, items of interface with Work performed by others, and specified construction, start-up and performance tests.
- h) The Contractor shall include in the Schedule inclusive in the Contract Time allotted, three 3 Working Days for the City to conduct a Walk-through.
- i) The Contractor shall include in the Schedule inclusive in the Contract Time allotted 10 Working Days for generation of the Punchlist. The Contractor shall Work diligently to complete all Punchlist items within 20 Working Days after officially being provided the Punchlist by the Engineer.
- j) If the Contractor modifies or changes the Schedule, for Change Order Work or otherwise, the Engineer shall be notified in writing with an explanation.
- k) Comments made by the Engineer on the Schedule during review will not relieve the Contractor from compliance with requirements of the Contract. The Engineer may request that the Contractor and major Subcontractors (defined herein as being any Subcontractor or Supplier with 5% or more of the value of the Contract) participate in review of any Schedule

submission. The Schedule revisions shall be submitted within 10 Working Days after the Engineer's review.

- l) The Schedule shall show work to be done by the City personnel, such as but not limited to, submittal reviews (separate tasks for each), sewer televising, water main connections, water testing, and operational performance tests as separate tasks. The Schedule shall show appropriate time allowances for Work performed by other agencies.
- m) If completion of any part of the Work, delivery of equipment or materials, or provision of the Contractor submittals is behind schedule and will impact the completion date of the Work, the Contractor shall submit a written recovery plan acceptable to the Engineer for completing the Work by the current Contract completion date.
- n) The Contractor shall not be entitled to any extension in Contract Time, or recovery for any delay incurred because of extensions in an early completion date, until all Contract float is used, performance of the Work extends beyond the corresponding Contract Time, and a recovery plan is submitted demonstrating that the delay cannot be mitigated or offset through actions such as rescheduling Work.
- o) Misrepresentation of actual Work durations in order to suppress available float time shall be cause for rejection of the Schedule and any revisions or updates.
- p) The Schedule shall include procurement related activities which lead to the delivery of permanent materials to the Site in a timely manner. Procurement activities include activities such as preparation of Shop Drawings and Working Drawings, review and acceptance of Shop Drawings and Working Drawings, materials fabrication, materials delivery, etc., as appropriate.
- q) The Schedule shall be reasonably balanced over the construction duration. Upon receipt, the Engineer will review the Schedule and provide comments, as appropriate, for revision by the Contractor.
- r) Each Schedule activity shall be assigned a budget. Separate Bid items shall be separate activities. The Schedule shall specify costs for each phase of the Contract. The cost value of all Schedule activities shall equal the Contract values shown in the Bid both individually and in total and include Change Orders.
- s) If the Engineer questions the logic of the Schedule, the Engineer may at any time request a Schedule narrative that describes the approach to the Work and the rationale used to develop the Schedule relationships and logic.
- t) When specified in the Contract Documents, the specified Plant Establishment Period is included in the stipulated Contract Time and will begin with the acceptance of the installation of the re-vegetation plan in accordance with the **Special Provisions**.
- u) For phased funded contracts, the Schedule shall include the Work to be completed as part of the first phase of the Phased Funding Schedule and all remaining phases.

ADD: 6-1.1.1 Contracts Less Than \$500,000 In Value. The Contractor shall **provide the Schedule** to the Engineer at the pre-construction meeting. At a minimum, the Schedule shall conform to the following:

- a) Provide a fully developed horizontal bar-chart type schedule.
- b) Provide a separate time bar for each significant construction activity.

- c) Provide a continuous vertical line to identify the first Working Day of each week.
- d) Within each time bar, indicate estimated completion percentage in 10% increments. As Work progresses, place a contrasting mark in each bar to indicate actual completion.
- e) Indicate graphically sequences necessary for completion of related portions of the Work.
- f) Be of sufficient size to show data for the entire Contract Time.

ADD: 6-1.1.2 Contracts With More Than \$500,000 In Value. The Contractor shall provide the Schedule to the Engineer no later than the date of the pre-construction meeting. The Contractor may provide a look-ahead schedule for the first 90 days of the Contract Time to the Engineer, prepared in accordance with 6-1, "CONSTRUCTION SCHEDULE AND COMMENCEMENT OF THE WORK." If the Contractor selects to provide a 90 days look-ahead schedule, the Schedule covering the full Contract Time shall be submitted and approved within 4 weeks after NTP.

The Contractor shall use any scheduling product by ORACLE'S PRIMAVERA or equal program capable of producing the required information in accordance with 6-1, "CONSTRUCTION SCHEDULE AND COMMENCEMENT OF THE WORK", for the computerized CPM scheduling and monthly update reports. Electronic file submittals shall be compatible with Primavera P6 format used by the City.

In addition to the electronic submittal of the Schedule, the Contractor shall provide hard copy tabular reports in accordance with 2-5.3, "Submittals." The Schedule shall contain as a minimum the following information:

- a) The Schedule shall include the Project name, City's Project identification numbers, the Contractor's name, address and phone number, dates of original schedule and latest revision, revision number, and Contract Time.
- b) The Schedule shall be of sufficient detail to assure adequate planning has been done for proper execution of the Work such that, in the sole judgment of the Engineer, it provides an appropriate basis for monitoring progress.
- c) The Schedule shall show the sequence, duration, both early and actual start and end dates of each activity, interdependence, critical path and percentage of completion status of all activities required for the complete performance of Work. It shall begin with the date of issuance of the NTP and include construction activities including submittal review, operation checks, final walk-through, and Punchlist generation.
- d) The Schedule shall include the cost associated with each activity and the total cost for each phase of the Contract. The cost information shown in the Schedule will be used for schedule evaluation and budgetary forecasting purposes only, and shall not be construed as entitlement for payment.
- e) The graphical reports when specified or required by the Engineer shall be in a precedence diagram format, shall be plotted on a time-scaled calendar, and shall expressly identify the Contract Time, the critical path(s) and activities.
- f) Activities shall be shown on their early dates, with their total float noted beside them. Connections between activities whether on the same sheet or on different sheets, shall identify both predecessor and successor Work. Activity data shall include description of Work, activity costs (budget), activity duration and special codes.
- g) Activity data shall include description of the Work, activity duration, percent completed, and any special codes required with the following information:

- i. Current status of the activity.
 - ii. Remaining duration of the activity.
 - iii. Actual start and finish dates for the activity in progress or completed.
- h) The Schedule updates shall include both forecast and actual cost and schedule data.
- i) The sub-tasks for lump sum Bid items shown on the Schedule shall be submitted in accordance with 9-2, "LUMP SUM ITEMS."
- j) The Schedule shall indicate the estimated person days and material quantities for each construction activity.
- k) For those activities started but not yet completed at the time of submittal, the updated Schedule shall reflect the percentage of costs remaining, as agreed between the Contractor and the Engineer, for an estimate of the remaining budget.

6-1.2 Commencement of Work. ADD the following:

Upon the request of the Contractor, the City may delay the issuance of the Notice to Proceed (NTP) from the date of the pre-construction meeting up to:

- a) 5 Working Days,
- b) 40 Working Days for the preparation, submittal, obtaining approval for and filing of the PRDs in accordance with 801, "STORM WATER POLLUTION CONTROL", or
- c) 60 Working Days for the preparation, submittal, and approval of the TCP on "D-sheets" when specified in 7-10.2, "Traffic Control."

For other areas that do not require engineered TCP on D-sheets, the Contractor may at any time after the Pre-Construction meeting obtain a TCP Permit via Working Drawings or the City's over the counter process and start the Work. If the Contractor decides to commence the construction work before the completion of the D-sheet TCPs, the Contractor shall forfeit the 60 Working Days specified here and the NTP will be issued. The D-sheet TCP shall be done concurrently and no additional time will be granted.

No time extension of this delay will be allowed. The number of Working Days to postpone the NTP shall be requested by the Contractor at the pre-construction meeting. In no event shall the NTP be issued more than 60 Working Days from the Pre-Construction meeting.

For paving Work, the Contractor shall coordinate Work to facilitate the installation and protection of the new curb ramps and associated concrete work prior to commencing the asphalt overlay operations. The Work at a specific location shall not commence until all layouts and measurements are agreed upon by both the Contractor and Engineer.

For the Design-Build contracts, the Design-Builder shall not begin construction of the Project or any portions thereof until the Engineer approves the design for the Project or portion thereof, to provide the City the defenses set forth in California Government Code § 830.6.

No time extension of this delay will be allowed. The number of Working Days to postpone the NTP shall be requested by the Contractor at the pre-construction meeting. In no event shall the NTP be issued more than 60 Working Days from the Pre-Construction meeting.

For paving Work, the Contractor shall coordinate Work to facilitate the installation and protection of the new curb ramps and associated concrete work prior to commencing the asphalt overlay

operations. The Work at a specific location shall not commence until all layouts and measurements are agreed upon by both the Contractor and Engineer.

For the Design-Build contracts, the Design-Builder shall not begin construction of the Project or any portions thereof until the Engineer approves the design for the Project or portion thereof, to provide the City the defenses set forth in California Government Code § 830.6.

ADD: 6-1.3 Work Outside Normal Working Hours. Except in connection with the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise indicated in the Contract Documents, Work at the Site shall be performed during Normal Working Hours. Normal Working Hours refers to the working hours identified in the Contract Documents. The Contractor shall not work outside Normal Working Hours without the Engineer's written consent.

The Engineer will coordinate inspection staff, to the extent possible, to accommodate Project inspection requirements. If the Contractor's request for working during outside Normal Working Hours is approved, the Contractor will be responsible for reimbursing the City for all costs to provide inspection services outside Normal Working Hours through. A deductive Change Order will be issued to compensate the City.

The Contractor shall be required to obtain a noise abatement permit when such a permit is required to perform the Work outside Normal Working Hours.

Payment for the permits shall be included in the various Bid items.

ADD: 6-1.4 Phased Funding.

6-1.4.1 General. Phase Funding is a means by which large projects, encompassing multiple tasks and taking place over an extended period of time, may be budgeted and appropriated in a multi-phase plan and contracted accordingly that maximizes the City's use of available funds. The decision to utilize phased funding shall be solely at the discretion of the City.

If this contract is specified on the Contract Documents to be subject to phased funding, the phased funding requirements in these specifications shall apply.

6-1.4.2 Pre-Award Schedule. The Pre-Award Schedule is a cost-loaded CPM schedule prepared in accordance with 6-1, "CONSTRUCTION SCHEDULE AND COMMENCEMENT OF THE WORK" showing all activities with costs, durations, and dependencies, for the first phase of the contract. The Pre-Award Schedule shall be used as a basis for the first Phased Funding Schedule Agreement which will be developed by the City.

For phased funded contracts, the City typically secures enough funds for the first 90 days of the contract prior to award. Within 10 Working Days after Bid opening date the Apparent Low Bidder shall contact the Project Manager to discuss fund availability and the duration of the first phase and submit the Pre-Award Schedule to the City for approval and preparation of the first Phased Funding Schedule Agreement. If the Bid submitted by the Apparent Low Bidder is rejected by the City for any reason, then within 5 Working Days after receiving notice, the next Apparent Low Bidder shall provide the Pre-Award Schedule. This process shall continue until the City has selected the lowest responsible and reliable Bidder or has decided to reject all Bids.

The Contractor shall coordinate the estimated construction start date with the City's Project Manager. Upon receipt, the Project Manager will review the Pre-Award Schedule and provide comments, as appropriate, for revision by the Contractor. The Project Manager may require backup documentation and calculations to justify schedules.

6-1.4.3 First Phased Funding Schedule Agreement. The first Phased Funding Schedule Agreement shall show the fund availability for the first phase. Within 22 Working Days from the date of the Bid

Opening or notice to the next Apparent Low Bidder (whichever occurs last) and once a Pre-Award Schedule is accepted by the City, the City will present the first Phased Funding Schedule Agreement to the Contractor that is selected as the lowest responsible and reliable Bidder as defined in the San Diego Municipal Code, §22.3003.

At the Project Manager's request, the Contractor shall meet with the Project Manager before execution of the first Phased Funding Schedule Agreement to discuss the Project Manager's comments and requests for revision to the Pre-Award Schedule.

Failure by the Contractor to perform the following may result in the Bid being rejected as non-responsive:

- a) meet with the Project Manager, if requested to do so, to discuss and respond to the City comments regarding the Pre-Award Schedule,
- b) revise the Pre-Award Schedule as requested by the City within the specified 22 Working Days timeframe, or
- c) execute the first Phased Funding Schedule Agreement within a day after receipt.

Once executed by both parties, the first Phased Funding Schedule Agreement shall become part of the Contract Documents. The first Phased Funding Schedule Agreement Form is included in the Bidding Documents.

The City reserves the right to award the first phase with duration of fewer than 90 Working Days.

6-1.4.4 Final Phased Funding Schedule Agreement. After Award the Contractor's approved Schedule shall serve as the basis for the final Phased Funding Schedule Agreement, which includes the total contract amount and all phases. The City and Contractor may mutually agree to revise the first phase; however, the total funds allocated as part of the previously approved Pre-Award Schedule shall not be exceeded.

The final Phased Funding Schedule Agreement shall define payment limitations and the respective obligations of the parties in accordance with 9-3.6, "Phased Funding Compensation."

ADD: 6-1.5 Contract Time Extensions. The Contract Time shall not be modified except by Change Order. The Contractor shall immediately submit to the City a written request for a Change Order to modify the Contract Time, but in no event later than 24 hours after the occurrence and discovery of the event(s) giving rise to the request. The Contractor shall include in its request a general description of the basis for and the estimated length of any extension and submit supporting data. Any City approval of a request shall be contingent upon the Contractor's submission of a written statement that the Contract Time extension reflects the entire extension to which the Contractor is entitled as a result of the occurrence of the event(s).

The City will not grant an extension in Contract Time unless the Contractor demonstrates through an analysis of the critical path that: 1) the increases in the time to perform all or part of the Project, beyond the Contract Time, arise from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, their agents, officers, and/or employees; and 2) the causes actually rendered performance of all or part of the Project beyond the corresponding Contract Time, despite the Contractor's reasonable and diligent actions to avoid the extension.

Delays attributable to and within the control of the Contractor's Subcontractors shall be deemed to be delays within the control of the Contractor. The City will not allow time extensions for these delays.

The City will issue a weekly or monthly document that will stipulate the Contract Time. If the Contractor does not agree with this document, the Contractor shall within 15 days after receipt of the statement submit to the City for review a written protest supporting the Contractor's objections to the document. The Contractor's failure to file a timely protest shall constitute the Contractor's acceptance

of the City's weekly document. If the Contractor's protest is considered to be a claim for time extension, it shall be subject to 3-7, "Claims."

The Contractor shall be fully responsible for any delays arising from the Contractor's design of the Project when engineering services are included in the Work.

ADD: 6-1.6 Excusable Delays. To the extent any of the following events results in an actual delay in the Work affecting Work activities on the critical path, such shall constitute an "Excusable Delay", to the extent not set forth below, a delay will be considered an "Inexcusable Delay":

- a) Failure or inability of the City to make available any portion or the entire Site in accordance with the requirements of the Schedule.
- b) Failure or inability of the City or the Contractor to obtain necessary zoning changes, variances, code changes, permits or approvals from any governmental authority, or failure to obtain any street or alley vacations required for the performance of the Work, except to the extent due to the fault or neglect of the Contractor as determined by the City.
- c) Delays resulting from the acts or omissions of Separate Contractors, except to the extent Separate Contractors perform their work properly and in accordance with the Schedule.
- d) Delays resulting from Force Majeure.
- e) Differing, unusual or concealed site conditions that could not reasonably have been anticipated by the Contractor in preparing the Schedule.
- f) Delays resulting from the existence or discovery of hazardous materials or waste on the Site not brought to the Site by the Contractor.
- g) Delays resulting from changes in Applicable Laws occurring after the date of execution of this contract;
- h) Delays occurring due to the acts or omissions of the City and those within the control of the City.
- i) Delays resulting from the City-mandated suspensions of Work.

ADD: 6-1.7 Payment. Payment for Schedule shall be included in the various Bid items **unless a Bid item has been provided.**

ADD: 6-2.1 Moratoriums. When moratorium periods are **specified in the Special Provisions**, the Contractor shall completely demobilize all construction related activity, equipment and materials within stated limits prior to beginning of moratorium period(s), at no additional cost to the City. The Work that is started prior to the moratorium shall be completed prior to the moratorium start date.

The Site shall be fully restored and cleaned prior to each moratorium, including, but not limited to, sidewalks, streets, and paving. No equipment, materials, or traffic control shall be left on-site during the moratorium period(s). Trenches shall be capped during moratorium periods. No temporary resurfacing shall be allowed.

Payment for compliance with moratorium requirements shall be included in the various Bid items. The Contractor will not be entitled to any additional costs for remobilization to continue the work after the moratorium periods.

6-3.1 General. ADD the following:

The City reserves the right to shut down any trenching operation if the Contractor is not proceeding within a reasonable period of time to restore the pavement and Site cleanup. A reasonable period of time is considered to be 5 to 10 Working Days after backfilling any one block (600'+/-) of pipeline. The period of time allowed will be determined by the Engineer and is not subject to dispute by the Contractor.

During periods when the Work is suspended, the Contractor shall make appropriate arrangements for any emergency work which may be required to be performed under the supervision of the Contractor's representative.

6-3.2 Archaeological and Paleontological Discoveries. ADD the following:

The Contractor's attention is directed to Section 808, "RESOURCE DISCOVERIES" of these specifications.

6-4 DEFAULT BY THE CONTRACTOR. DELETE in its entirety and SUBSTITUTE with the following:

6.4.1 General. The City will consider the Contractor in default of the Contract if prior to the Acceptance, the Contractor:

- a) becomes insolvent, assigns its assets for the benefit of its creditors, is unable to pay its debts as they become due, or is otherwise financially unable to complete the Work,
- b) abandons the Work by failing to report to the Work site and diligently prosecute the Work to completion,
- c) disregards written instructions from the City or materially violates provisions of the Contract Documents,
- d) fails to prosecute the Work according to the schedule approved by the Engineer,
- e) fails to notify the Engineer upon discovery of items of Native American, Archaeological, or Paleontological interests,
- f) disregards laws or regulations of any public body having jurisdiction, or
- g) commits continuous or repeated violations of regulatory or statutory safety requirements, then

Notices, and other written communications regarding default between the Contractor, the Agency, and the Surety shall be transmitted in accordance with 2-12, "SPECIAL NOTICES."

6-4.2 Notice to Cure. The City will issue a written notice to cure the default to the Contractor and its Surety. The Contractor shall commence satisfactory corrective actions within 5 Working Days after receipt.

6-4.3 Notice of Termination for Default. If the Contractor fails to commence satisfactory corrective action within 5 Working Days after receipt of the notice to cure, or to diligently continue satisfactory and timely correction of the default thereafter, then the City will consider the Contractor in default of the Contract and:

- a) will terminate the Contractor's right to perform under the Contract by issuing a written notice of termination for default to the Contractor and its Surety,
- b) may use any materials, equipment, tools or other facilities furnished by the Contractor to secure and maintain the Work site, and

- c) may furnish labor, equipment, and materials the Agency deems necessary to secure and maintain the Work site.

The provisions of this subsection shall be in addition to all other legal rights and remedies available to the City.

The Contractor shall be entitled to no further payment until the remaining portion of the Work has been completed. The Contractor will be paid the actual amount due based on Contract Unit Prices or lump sum Bid and the quantity of the Work completed at the time of default, less damages caused to the City by acts of the Contractor.

Costs incurred by the City in performing the Contractor's work, plus a markup of 15% on those costs for overhead, shall be deducted from monies due or to become due to the Contractor. The Contractor shall pay to the City any amount by which those costs and markup exceed the unpaid balance of the Contract Price.

6-4.4 Responsibilities of the Surety. Upon receipt of the written notice of termination for default, the Surety shall immediately assume all rights, obligations, and liabilities of the Contractor under the Contract. If the Surety fails to protect and maintain the Work site, the City may do so, and may recover all costs incurred.

The Surety shall notify the City that it is assuming all rights, obligations and liabilities of the Contractor under the Contract and all money that is due, or would become due, to the Contractor shall be payable to the Surety as the Work progresses, subject to the terms of the Contract.

Within 15 Working Days of receipt of the written notice of termination for default, the Surety shall submit to the City a written plan detailing the course of action it intends to take to remedy the default. The City will review the plan and notify the Surety if the plan is satisfactory. If the Surety fails to submit a satisfactory plan, or if the Surety fails to maintain progress according to the plan accepted by the City, the City may, upon 48 hours written notice, exclude the Surety from the premises, take possession of all material and equipment, and complete the Work in any way the City deems to be expedient.

The cost of completing the Work by the City shall be charged against the Surety and may be deducted from any monies due, or which would become due, the Surety. If the amounts due under the Contract are insufficient for completion, the Surety shall pay to the City, within 30 days after the City submits an invoice, all costs in excess of the remaining Contract Price.

The provisions of this subsection shall be in addition to all other rights and remedies available to the City under law.

6-4.5 Payment. The Surety will be paid for completion of the Work in accordance with 9-3 less the value of damages caused to the City by acts of the Contractor.

6-5 TERMINATION OF THE CONTRACT. DELETE in its entirety and SUBSTITUTE with the following:

6-5 TERMINATION OF THE CONTRACT FOR CONVENIENCE. The City may terminate the Contract in whole or, from time to time, in part, if it becomes impossible or impracticable to proceed, because of conditions or events beyond the control of the City e.g., if the City Council does not appropriate sufficient monies to fund the Contract.

The City will issue a written notice of termination for convenience in accordance with 2-12, "SPECIAL NOTICES." Upon receipt, the Contractor shall immediately proceed as follows:

- a) Stop Work immediately or in accordance with the Notice of Termination.

- b) Notify Subcontractors and suppliers to immediately cease their work and place no further subcontracts for materials, services, or facilities, except as necessary to complete any authorized continued portion of the Contract.
- c) Terminate all Subcontracts to the extent that they relate to the Work terminated.
- d) With approval by the Engineer, settle all outstanding obligations arising from the termination of subcontracts; the approval of which will be final for purposes of this section.
- e) As directed by the Engineer, transfer the title and deliver to the City, completed or partially completed drawings, plans, calculations, specifications and any other documents and records that, if the Contract had been completed, would be required to be furnished to the City.
- f) Complete performance of the Work not terminated.
- g) Take all necessary steps and actions to minimize all costs to the City as a result of the termination.
- h) Take any action that may be necessary, or that the Engineer may direct, for the protection and preservation of the property related to this contract that is in the possession of the Contractor and in which the City has or may acquire an interest.

The Contractor will be paid without duplication for:

- a) work completed in accordance with the Contract Documents prior to the effective date of termination for convenience;
- b) reasonable costs incurred in settlement of terminated contracts with Subcontractors, suppliers and others; and
- c) reasonable expenses directly attributable to termination.

The Contractor shall submit a final termination settlement proposal to the City no later than 90 days from the effective date of termination, unless extended, in writing, by the City upon written request by the Contractor.

If the Contractor fails to submit a proposal, the City may determine the amount, if any, due the Contractor as a result of the termination. The City will pay the Contractor the amount it determines to be reasonable. If the Contractor disagrees with the amount determined by the City as being reasonable, the Contractor shall provide notice to the City within 30 days of receipt of payment. Any amount due shall be as later determined by arbitration, if the City and the Contractor agree thereto, or as fixed in a court of law.

All settlements related to termination of the contract in accordance with this section will be subject to the approval of the Mayor or designee and may also require City Council approval before ultimately becoming final.

6-5.1 Termination Settlement. After termination, the Contractor shall submit a final termination settlement proposal to the Engineer in the form and with the certification prescribed by the Engineer. The Contractor shall submit the proposal promptly, but no later than 6 months from the effective date of termination, unless extended, in writing, by the Engineer upon written request of the Contractor within this 6 month period.

If the Engineer determines that the facts justify it, a termination settlement proposal may be received and acted on after 6 months or any extension. If the Contractor fails to submit the proposal within the time allowed, the City may, in good faith, determine, on the basis of information available, the fair and reasonable amount, if any, due the Contractor as a result of the termination and pay the amount

determined. If the Contractor does not agree that the amount determined by the Engineer is fair and reasonable and if the Contractor gives notice of such disagreement to the City in accordance with this subsection, within 30 days of receipt of payment, then the amount due shall be as later determined by arbitration, if the City and the Contractor agree thereto, or as fixed in a court of law.

6-5.2 Payment to the Contractor Due to Termination. Subject to 6-5.1, "Termination Settlement" the Contractor and the Engineer may agree upon the whole or any part of the amount to be paid because of the termination. The amount may include a reasonable allowance for profit on work done. The agreed amount may not exceed the total dollar amount authorized by the City as reduced by (1) the amount of payments previously made; and (2) the Contract Price of work not terminated. The contract shall be amended, and the Contractor paid the agreed amount. Subsection 6-5.3, "Failure to Agree on Payment," shall not limit, restrict, or affect the amount that may be agreed upon to be paid in accordance with this subsection.

6-5.3 Failure to Agree on Payment. If the Contractor and the City fail to agree on the whole amount to be paid because of the termination of Work, the City will pay the Contractor the fair and reasonable amounts determined in good faith by the City as follows, but without duplication of any amounts agreed on in accordance with 6-5.2, "Payment to Contractor Due to Termination:"

- a) The Contract Price for completed services accepted by the City not previously paid or adjusted for any saving of freight and other charges. The total of:
 - i. The costs incurred in the performance of the Work terminated, including initial costs and preparatory expense allocable thereto, but excluding any costs attributable to services paid or to be paid in accordance with 6-5.6, "Failure to Agree on Payment";
 - ii. The fair and reasonable cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the Contract if not included in subdivision "a", above;
 - iii. A sum, as provided in subdivision "a", above, determined by the Engineer to be fair and reasonable under the circumstances; however, if it appears that the Contractor would have sustained a loss on the entire contract, had it been completed, the City will allow no profit and shall reduce the settlement to reflect the indicated rate of loss.
 - iv. The reasonable costs of settlement of the Work terminated, including:
 - v. Accounting, legal, clerical, and other expenses reasonably necessary for the preparation of termination of settlement proposals and supporting data;
 - vi. The termination and settlement of subcontracts (excluding the amounts of such settlements); and
 - vii. Storage, transportation, and other costs incurred, reasonably necessary for the preservation, protection, or disposition of property in which the City has or may acquire an interest.

6-5.4 Determination of Amount Due the Contractor. In arriving at the amount due the Contractor in accordance with this section, there shall be deducted:

- a) The fair value of property destroyed, lost, stolen, or damaged that has become undeliverable to the City except to the extent the City expressly assumed the risk of loss;
- b) all un-liquidated advance or other payments to the Contractor under the terminated portion of this contract;

- c) any claim which the City has against the Contractor under this contract; and
- d) the agreed price for or the proceeds of sale of materials, supplies, or other things acquired by the Contractor or sold under the provisions of this section and not recovered by or credited to the City.

6-5.5 Partial Termination. If the termination is partial, the Contractor may file a proposal with the Engineer for an equitable adjustment of the price(s) of the continued portion of the Contract. The City will make any equitable adjustment agreed upon. Any proposal by the Contractor for an equitable adjustment under this section shall be requested within 90 days from the effective date of termination, unless extended, in writing, by the Engineer.

6-5.6 Partial Termination Payments. The City may, under the terms and conditions it prescribes, make partial payments and payments against costs incurred by the Contractor for the terminated portion of the Contract if the Engineer believes the total of these payments will not exceed the amount to which the Contractor will be entitled.

If the total payments exceed amounts finally determined to be due, the Contractor shall repay the excess to the City upon demand, together with interest. Interest shall be at a rate of 6% per annum compounded daily and shall be computed for the period from the date the excess payment is received by the Contractor to the date the excess is repaid. Interest shall not be charged on any excess payment due to a reduction in the Contractor's termination settlement proposal because of retention or disposition, or a later date determined by the Engineer because of the circumstances.

6-5.7 Records and Documents Relating to Termination. Unless otherwise provided in the Contract or by statute, the Contractor shall maintain all records and documents relating to the terminated portion of this contract for 3 years after final settlement. This includes all books and other evidence bearing on the Contractor's costs, expenses, and settlement under this contract. The Contractor shall make these records and documents available to the City, at the Contractor's office, at all reasonable times, without any direct charge. If approved by the Engineer, photographs, microphotographs, and other authentic reproductions may be maintained instead of original records and documents.

6-5.8 Rights of the City Preserved. Where the Contract has been terminated by the City in accordance with 6-5, "Termination of Contract" the termination will not affect any rights or remedies of the City against the Contractor then existing or which may thereafter accrue. Any retention or payment of monies paid to the Contractor by the City shall not release the Contractor from liability.

ADD: 6-6.1.1 Damages Caused By Act Of God. As provided in §7105 of the California Public Contract Code, if this contract is not financed by revenue bonds, the Contractor shall not be responsible for the cost of repairing or restoring damage to the Project when damage was proximately caused by an act of God, in excess of 5% of the Contract Price if:

- a) the Project damaged was built in accordance with the Contract requirements, and
- b) there are no insurance requirements in the Contract for the damages.

ADD: 6-6.5 Contract Time Extension and Schedule Analysis. A claim for extension in Contract Time will not be granted unless the Contractor can demonstrate through a Critical Path Method (CPM) analysis of the Schedule's critical path(s) that the increases in the time to perform or complete the Work, or specified part of the Work, beyond the corresponding Contract Time arise from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, and that such causes in fact lead to performance or completion of the Work, or specified part in question,

beyond the corresponding Contract Time, despite the Contractor's reasonable and diligent actions to guard against those effects.

The Schedule analysis shall use delay sub networks ("fragnets") to show the impact of the Work that is the basis of the Claim on specific impacted critical path Schedule activities. Fragnet is a group of schedule network activities representing a delay or change event.

Where the Contractor is prevented from completing any part of the Work within the Contract Time (or milestones) due to delay to a "critical path" activity beyond the control of both the City and the Contractor, an extension of the Contract Time (or Contract milestones) in an amount equal to the time lost on the critical path of the Project due to such delay shall be the Contractor's sole and exclusive remedy for such delay.

ADD: 6-6.7 Event of Force Majeure (Event). Any party to this contract may be excused for any delay or failure to perform its duties and obligations except for obligations to pay money, caused by and to the extent that such failure or delay is caused by an Event.

If an Event causes a delay or failure in performance of only a portion of the obligations of a Party, then only that portion of performance which was delayed or prevented by such cause shall be deemed excused. Performance of all other obligations of a Party shall not be excused by an Event. Any delay or failure to perform shall only excuse the Party for a period no longer than the delay or failure in performance caused by such Event. The Contractor shall not be entitled to damages or additional payment for any delay caused by an Event.

6-7 TIME OF COMPLETION: ADD The Following:

The Work shall be completed within the time specified in the Invitation to Bid.

The Contractor shall complete the liner installation of all segments of sewer mains and the lateral reinstatements as verified by the Engineer within the number of Working Days from the date of Notice to Proceed **specified in the Special Provisions**. The remaining work to be completed as part of this project including lateral lining, and post-lining CCTV video shall be completed within the remaining number of Working Days **specified in the Special Provisions**.

The specified days are cumulative for work in the same street over the duration of the entire project but are not required to be consecutive. Each day that traffic control, excavation, paving, or other work causing traffic disruption take place shall count towards the total for allowable Working Days in this subsection. If the Work exceeds Working Days specified in this subsection, separate liquidated damages will be assessed in accordance with 6-9, "LIQUIDATED DAMAGES" in addition to any liquidated damages assessed for the completion of the Contract.

6-7.1 General. ADD the following:

The following shall be included in the stipulated Contract Time:

- a) 30 Working Days for the first phase and 10 Working Days for each subsequent phase for City Force high-line work for water mains (if applicable),
- b) 30 Working Days for the City Forces TV inspection of sewer mains (if applicable), and
- c) any number of Working Days required for walk through and preparation and completion of Punchlist items specified in 6-1, "Construction Schedule and Commencement of the Work."

ADD: 6-7.4 Project Phasing. **When project phasing is provided in the Special Provisions**, the Contractor shall not proceed to the next phase unless the preceding phase is complete and accepted per terms and conditions of the Contract.

A maximum of 2 mainline crews shall be allowed to work concurrently on sewer and water mains for the entire construction duration and no additional mainline crews shall be allowed to work on this contract without prior written approval from the Engineer.

6-8 COMPLETION, ACCEPTANCE, AND WARRANTY. DELETE In its entirety and SUBSTITUTE with the following:

ADD: 6-8.1 Completion. The Contractor shall submit a written assertion that the Work has been completed. The Engineer will confirm the date the Work is complete. This will be the date when the Contractor is relieved from responsibility to protect and maintain the Work.

6-8.1.1 Requirements Preparatory To Requesting a Walk-through. Walk-through is the procedure used by the City to generate a Punchlist prior to Acceptance.

The following items shall be required prior to requesting a walk-through:

- a) Remove temporary facilities from the Site.
- b) Thoroughly clean the Site.
- c) Provide completed and signed Red-lines in accordance with 2-5.4, "Red-lines Drawings."
- d) Provide all material and equipment maintenance and operation instructions and/or manuals.
- e) Provide all tools which are a permanent part of equipment installed in the Project.
- f) Provide and properly identify all keys; construction and permanent.
- g) Provide all final Special Inspection reports required by the applicable building Code.
- h) Provide all items that this contract requires to be supplied as extra stock. All items shall be wrapped, sealed, or placed in a container as necessary to allow for storage by the City for future use. The amount specified in this contract shall be verified by the City and the Contractor.
- i) Ensure all EOCP documents and certified wage rate documents (if applicable) have been submitted from the NTP until Acceptance.
- j) The spare parts for the proposed irrigation system **as specified in the Special Provisions.**

6-8.1.2 Walk-through and Punchlist Procedure. The following procedure outlines the steps to be taken upon the Contractor's assertion that the Project is complete:

- a) When the Contractor considers that the Work and Services are complete, the Contractor shall in writing notify the City that the Project is complete and request that the City perform a walk-through for generation of a Punchlist. The Contractor shall notify the City at least 7 days in advance of the time the walk-through is to be performed.
- b) The City will determine if the Contractor is ready for a walk-through by verifying whether the Contractor has provided or completed all items as required by 6-8.1, "Defective Work," whether the Contractor has obtained the applicable certifications, and by evaluating completeness by inspecting the Project and the specified Work required by the Contract Documents.

- c) If the Work includes underground sewer conduit installations, the inspection will include televising in accordance with 306-1.4.8, "Televising Sewer Mains and Storm Drains."
- d) The City will facilitate a walk-through.
- e) The Contractor shall make available at the Site for walk-through attendees the plans and specifications and the technical data such as submittals and equipment manuals.
- f) The City will generate the Punchlist within 15 Working Days from the date of the walk-through and submit it to the Contractor. The City will not provide a preliminary Punchlist.
- g) If the City begins to generate a Punchlist and finds the Project is not substantially complete as defined herein, the City will terminate the walk-through and notify the Contractor in writing.
- h) If, at any time during the City's evaluation of the corrective Work required by the Punchlist, the City discovers that additional corrective Work is required, the City may include that corrective Work in the Punchlist. The Contractor shall be solely responsible for the Site until the Project is completely operational, all Punchlist items have been corrected, and all operation and maintenance manuals have been accepted by the City.
- i) The City will meet with the Contractor until all Punchlist items are corrected. If the Contractor takes longer than 30 Working Days to complete the corrective Work, the Project shall be subject to re-evaluation.
- j) During the 35 day stop notice/lien period which commences on the date the NOC is recorded, the Contractor shall submit to the City the retention billing. After the City receives the retention billing, the City will mail to the Contractor a "Release of Claims" form, which shall be completed by the Contractor and returned to the City before the retention will be released.
- k) Upon Acceptance, the Contractor shall assemble and deliver to the City all records, documents, warranties, material certifications, bonds, guarantees, maintenance and service agreements, and maintenance and operating manuals. Written warranties, except manufacturer's standard printed warranties, shall be on the Contractor's and the Contractor's agents, material suppliers, installers, or manufacturer's letterhead, addressed to the Contractor. Warranties shall be submitted in the format described in this section, modified as approved by the City to suit the conditions pertaining to the warranty.

6-8.2 Acceptance. Acceptance will occur after the requirements contained in the Contract Documents have been fulfilled. If, in the Engineer's judgment, the Work is ready for acceptance, the Engineer will accept the Work.

6-8.3 Warranty. **Unless specified otherwise,** the Work shall be warranted by the Contractor against defect for a period of 1 year or as extended by the manufacturers' and suppliers' standard warranties.

The Contractor shall provide an unconditional warranty on all installed fiber optic cable for a minimum period of 2 years.

The warranty period for the following items of the Work shall be 5 years:

- a) Work under Section 500
- b) DWT Construction
- c) LED signal modules

- d) Private sewer pumps including the alarm panel and all other accessories. The Contractor shall provide the City and property owner a copy of the warranty.

The Contractor shall involve the manufacturer in the installation and startup as needed to secure any extended warranty required.

The warranty period starts from the date the Work was accepted by the City. The warranty period for specific items of Work covered under manufacturers' or suppliers' warranties shall commence on the date they are placed into service at the direction of or as approved by the Engineer in writing.

With respect to all warranties, expressed or implied, from Subcontractors and Suppliers for the Work, the Contractor shall require all warranties to be executed, in writing, for the benefit of the City.

The Contractor shall replace or repair defective Work in a manner satisfactory to the Engineer, after notice to do so from the Engineer, and within the time specified in the notice. If the Contractor fails to make such replacement or repairs within the time specified in the notice, the City may perform replacement or repairs and bill the Contractor for the costs, the Surety shall be liable for the cost thereof.

6-8.3.1 Defective Work. If the Work, or any part thereof, is found to be defective, whether or not manufactured, fabricated, installed, completed or overlooked and accepted by the City, the Contractor shall, promptly and in accordance with the written instructions of the City and within the reasonable time limits stated therein, either correct such defective Work, or, if it has been rejected by the City, remove it from the Site and replace it with non-defective and conforming Work.

- a) If, upon notice, the Contractor fails to immediately correct the Defective Work, or the Contractor fails to correct the Defective Work in a manner conforming to the Contract Documents, the City may order the Contractor to stop all or part of the Project; however, the City's right to stop the Project shall not give rise to any duty on the part of the City to stop Work for the benefit of the Contractor or any other party. The Contractor shall bear all direct and indirect costs and damages that result from the City's stop work notice.
- b) The City may determine in its sole discretion to accept Defective Work in lieu of requiring the Contractor to correct or remove and replace the Defective Work. However, the Contractor shall bear all direct and indirect costs of the Defective Work, and the diminished value to the Project, as determined by the City evaluation. If the City's acceptance of Defective Work occurs prior to Final Payment, the City will issue a Change Order incorporating the necessary revisions in the Contract Documents with respect to the Defective Work and affording the City the appropriate decrease in the Contract Price.
- c) If the Contractor fails to correct, remove, or replace Defective Work within 5 Working Days from the date of written notice from the City, the City may proceed expeditiously with any correction of Defective Work undertaken in accordance with this section. The City may remedy at a sooner time in the event of an emergency. The City may remedy after 5 Working Days from the date of written notice when the Contractor fails to correct the Defective Work in accordance with the Contract Documents, or when the Contractor fails to comply with any other provision of the Contract Documents.
- d) When undertaking remedial action under this section, the City may: exclude the Contractor from all or part of the Site; take possession of all or part of the Work, and suspend the Contractor's Work and or Services related thereto; and incorporate into the Project all materials and equipment stored at the Site or for which the City has paid but the Contractor has stored elsewhere.

- e) The Contractor shall not be allowed an extension of the Contract Time or milestones because of any delay in the performance of the Project attributable to the City's undertaking remedial action to correct Defective Work.
- f) For Building Projects which require a certificate of occupancy, not including sewer and water facilities, if the Contractor fails to correct the defective work listed on the City's "Punchlist" within 45 days after the Contract duration, the Contractor shall be responsible for reimbursing the City for all costs to provide inspection services required to monitor Work beyond the forty 45 days. The Contractor shall be billed for the additional inspection at the City's established rates.
- g) If the Contractor completes the Project or portions thereof prior to the time the NOC are issued, the Contractor shall preserve equipment by developing and implementing a preventive maintenance program in compliance with manufacturer's recommendations.
- h) The warranty period for Work under Section 500 shall be 5 years from the Acceptance.
- i) The traffic signal and lighting system equipment repairs or replacement shall be made within 72 hours after notification of defects by the City.
- j) The Contractor shall pay for any claims, costs, losses, and damages incurred by the City in remedying any deficiency e.g., all costs of repair or replacement of Defective Work and all costs of repair of any other Work on the Project destroyed or damaged by correction, removal, or replacement of the Contractor's Defective Work.

6-8.3.2 Warranty Format Requirements. The warranty documentation shall conform to the following requirements:

- a) Written warranties, except manufacturer's standard printed warranties, shall be on the Contractor's and its agents', material suppliers', installers', or manufacturers' own letterhead, addressed to and for the benefit of the City. Warranties shall be submitted in the format described in this section, modified as approved by City to suit the conditions pertaining to the warranty.
- b) The Contractor shall obtain warranties, executed in triplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of Work. Except for items put into use with City's permission with date mutually agreed upon in writing, The Contractor shall ensure the beginning time of warranty is the Project Completion date.
- c) The Contractor shall verify that documents are in proper form, contain full information, and are notarized.
- d) The Contractor shall verify that warranties are signed by both the Contractor and the appropriate agent.
- e) The Contractor shall retain warranties until the time specified for submittal to City.
- f) The warranties shall be provided to City with a neatly typed Table of Contents, identifying each warranty with the number and title of the applicable specification section requiring the warranty and the name of the product or Work item.
- g) Each warranty shall be separated with index tab sheets keyed to the Table of Contents listing. Complete information shall be provided, using separate typed sheets as necessary. The

information shall include a list of Subcontractors, supplier, and manufacturer, with name, address and telephone number of responsible principal.

6-8.3.3 Correction of Work During Warranty. If within one year (or a longer applicable warranty period) after the date for commencement of warranties under the Contract Documents, any item of the Work is found to be Defective Work, the Contractor shall correct it promptly after receipt of written notice from the City to do so unless the City has previously given the Contractor a specific written acceptance of such condition after the City has been specifically informed in writing by the Contractor that the condition is not in accordance with the Contract Documents. This period of one year (or a longer applicable warranty period) shall be extended with respect to portions of the Work corrected as part of the warranty requirements.

6-9 LIQUIDATED DAMAGES. MODIFY to increase the daily value from \$250 to \$500 for contracts with a value of over \$100,000.

Failure to complete the liner installation and lateral reinstatement as specified in Part 5, "SYSTEM REHABILITATION," within the Contract Time will result in damages being sustained by the City.

ADD: 6-11 RIGHT TO AUDIT.

6-11.1 The City's Right. The City retains the right to review and audit, and the reasonable right of access to the Contractor's and all Subcontractor's premises to review and audit the Contractor's compliance with the provisions of this contract (City's Right). The City's Right includes the right to inspect and photocopy same, and to retain copies, outside of the Contractor's premises, of any and all records with appropriate safeguards, if such retention is deemed necessary by the City in its sole discretion. This information shall be kept by the City in strictest confidence.

The Contractor shall include the City's Right in any and all of their subcontracts, and shall ensure that these specifications are binding upon all Subcontractors.

6-11.2 Audit. The City's Right includes the right to examine any and all books, records, documents and any other evidence of procedures and practices that the City determines is necessary to discover and verify that the Contractor is in compliance with all requirements under this contract.

If there is a claim for additional compensation or for changes in Work, the City's Right to Audit includes the right to examine books, records, documents, and any and all other evidence and accounting procedures and practices that the City determines is necessary to discover and verify all direct and indirect costs, of whatever nature, which are claimed to have been incurred, anticipated to be incurred, or for which a claim for additional compensation or for changes in the Work have been submitted.

The Contractor shall maintain complete and accurate records in accordance with generally accepted accounting practices in the construction industry. The Contractor shall make available to the City for review and audit all Project related accounting records and documents, and any other financial data. Upon the City's request, the Contractor shall submit exact duplicates of originals of all requested records to the City.

6-11.3 Compliance Required Before Mediation and Litigation. A condition precedent to proceeding with mandatory mediation and further litigation provided for in 3-6, "DISPUTE RESOLUTION PROCESS" is the Contractor's full compliance with these specifications within 60 days of the date on which the City mails a written request in accordance with 2-12, "SPECIAL NOTICES" to review and audit compliance.

6-11.4 Access to Records on Federally Funded Projects. The Contractor shall retain all records, books, papers, and documents directly pertinent to the Contract for a period of not less than 5 years after grantees or subgrantees make Final Payments and all other pending matters are closed; and allow access to said records by the grantee, subgrantee, the Federal Grantor Agency, the Comptroller General of the United States, or any duly authorized representatives.

SECTION 7 – RESPONSIBILITIES OF THE CONTRACTOR

7-1.2 Temporary Utility Services. ADD the following:

The Contractor shall provide and pay for all utilities e.g., electrical, gas, and water required for construction and maintenance activities (e.g., testing and commissioning and vegetation maintenance) until the Project is accepted.

7-2.2 Laws. ADD the following sentence to the last paragraph:

For contracts subject to payment of prevailing wages, the Contractor shall submit certified weekly payrolls to the City reflecting the wages of all the Contractor and Subcontractor employees engaged in the Work each month.

7-3 LIABILITY INSURANCE. DELETE in its entirety and SUBSTITUTE with the following:

The insurance provisions herein shall not be construed to limit the Contractor's indemnity obligations contained in this contract.

ADD: 7-3.1 Policies and Procedures. The Contractor shall procure the insurance described below, at its sole cost and expense, to provide coverage against claims for loss including injuries to persons or damage to property, which may arise out of or in connection with the performance of the Work by the Contractor, the Contractor's agents, representatives, officers, employees or subcontractors. The Contractor shall maintain this insurance for the duration of this contract and at all times thereafter when the Contractor is correcting, removing, or replacing Work in accordance with this contract. The Contractor's liabilities under this contract, e.g., the Contractor's indemnity obligations, shall not be deemed limited to the insurance coverage required by this contract.

Payment for insurance shall be included in the various items of Work as bid by the Contractor, and except as specifically agreed to by the City in writing, the Contractor shall not be entitled to any additional payment. The Contractor shall not begin any work under this contract until it has provided and the City has approved all required insurance. Policies of insurance shall provide that the City is entitled to 30 days (ten days for cancellation due to non-payment of premium) prior written notice of cancellation or non-renewal of the policy. Maintenance of specified insurance coverage is a material element of this contract and the Contractor's failure to maintain or renew coverage or to provide evidence of renewal during the term of this contract may be treated by the City as a material breach of contract.

ADD: 7-3.2 Types of Insurance.

7-3.2.1 Commercial General Liability Insurance. Commercial General Liability Insurance written on the current version of the ISO Occurrence form CG 00 01 07 98 or an equivalent form providing coverage at least as broad. The policy shall cover liability arising from premises and operations, XCU (explosions, underground, and collapse), independent contractors, products/completed operations, personal injury and advertising injury, bodily injury, property damage, and liability assumed under an insured's contract (including the tort liability of another assumed in a business contract). There shall be

no endorsement or modification limiting the scope of coverage for either “insured vs. insured” claims or contractual liability. The Contractor shall maintain the same or equivalent insurance for at least 10 years following completion of the Work. All costs of defense shall be outside the policy limits. Policy coverage shall be in liability limits of not less than the following:

<u>General Annual Aggregate Limit</u>	<u>Limits of Liability</u>
Other than Products/Completed Operations	\$2,000,000
Products/Completed Operations Aggregate Limit	\$2,000,000
Personal Injury Limit	\$1,000,000
Each Occurrence	\$1,000,000

7-3.2.2 Commercial Automobile Liability Insurance. The Contractor shall provide at its expense a policy or policies of Commercial Automobile Liability Insurance written on the current version of the ISO form CA 00 01 12 90 or later version or equivalent form providing coverage providing coverage at least as broad in the amount of \$1,000,000 combined single limit per accident, covering bodily injury and property damage for owned, non-owned and hired automobiles (“Any Auto”). All costs of defense shall be outside the limits of the policy.

7-3.2.3 Commercial Pollution Liability Insurance. The Contractor shall procure and maintain at its expense require its subcontractor, as described below to procure and maintain, the Contractors Pollution Liability Insurance including contractual liability coverage to cover liability arising out of cleanup, removal, storage, or handling of hazardous or toxic chemicals, materials, substances, or any other pollutants by the Contractor or any Subcontractor in an amount not less than \$2,000,000 limit for bodily injury and property damage. All costs of defense shall be outside the limits of the policy. Any such insurance provided by a subcontractor instead of the Contractor shall be approved separately in writing by the City. Approval of a substitution of a subcontractor’s insurance shall require a certification by the Contractor that all activities for which the Contractors Pollution Liability Insurance will provide coverage will be performed exclusively by the Subcontractor providing the insurance. The deductible shall not exceed \$25,000 per claim.

Contractual liability shall include coverage of tort liability of another party to pay for bodily injury or property damage to a third person or organization. There shall be no endorsement or modification of the coverage limiting the scope of coverage for either “insured vs. insured” claims or contractual liability. Occurrence based policies shall be procured before the Work commences and shall be maintained for the duration of this contract. Claims Made policies shall be procured before the Work commences, shall be maintained for the duration of this contract, and shall include a 12 month extended Claims Discovery Period applicable to this contract or the existing policy or policies shall continue to be maintained for 12 months after the completion of the Work under the Contract without advancing the retroactive date. Except as provided for under California law, the policy or policies shall provide that the City is entitled to 30 days prior written notice (10 days for cancellation due to non-payment of premium) of cancellation or non-renewal of the policy or policies.

7-3.2.4 Contractors Hazardous Transporters Pollution Liability Insurance. The Contractor shall provide at its expense or require its subcontractor to provide, as described below Contractors Hazardous Transporters Pollution Liability Insurance including contractual liability coverage to cover liability arising out of transportation of hazardous or toxic, materials, substances, or any other pollutants by the Contractor or any subcontractor in an amount not less than \$2,000,000 limit per occurrence/aggregate for bodily injury and property damage. All costs of defense shall be outside the limits of the policy. The deductible shall not exceed \$25,000 per claim. Any such insurance provided by a subcontractor instead of the Contractor shall be approved separately in writing by the City. Approval of the substitution of a subcontractor’s insurance shall require a certification by the Contractor that all

activities for which Contractors Hazardous Transporters Pollution Liability Insurance will provide coverage will be performed exclusively by the Subcontractor providing the insurance.

Contractual liability shall include coverage of tort liability of another party to pay for bodily injury or property damage to a third person or organization. There shall be no endorsement or modification of the coverage limiting the scope of coverage for either “insured vs. insured” claims or contractual liability. Occurrence based policies shall be procured before the Work commences and shall be maintained for the duration of this contract. Claims Made policies shall be procured before the Work commences, shall be maintained for the duration of this contract, and shall include a 12 month extended Claims Discovery Period applicable to this contract or the existing policy or policies shall continue to be maintained for 12 months after the completion of the Work under this contract without advancing the retroactive date. Except as provided for under California law, the policy or policies shall provide that the City is entitled to 30 days prior written notice (10 days for cancellation due to non-payment of premium) of cancellation or non-renewal of the policy or policies.

7-3.2.5 Contractors Builders Risk Property Insurance. The Contractor shall provide at its expense, and maintain until Final Acceptance of the Work, a Special Form Builders Risk Policy or Policies. This insurance shall be in an amount equal to the replacement cost of the completed Work (without deduction for depreciation) including the cost of excavations, grading, and filling. The policy or policies limits shall be 100% of this contract value of the Work plus 15% to cover administrative costs, design costs, and the costs of inspections and construction management.

Insured property shall include material or portions of the Work located away from the Site but intended for use at the Site, and shall cover material or portions of the Work in transit. The policy or policies shall include as insured property scaffolding, falsework, and temporary buildings located at the Site. The policy or policies shall cover the cost of removing debris, including demolition.

The policy or policies shall provide that all proceeds thereunder shall be payable to the City as Trustee for the insured, and shall name the City, the Contractor, Subcontractors, and suppliers of all tiers as named insured. The City as Trustee shall collect, adjust, and receive all monies which may become due and payable under the policy or policies, may compromise any and all claims thereunder, and shall apply the proceeds of such insurance to the repair, reconstruction, or replacement of the Work.

Any deductible applicable to the insurance shall be identified in the policy or policies documents and responsibility for paying the part of any loss not covered because of the application of such deductibles shall be apportioned among the parties except for the City as follows: if there is more than one claimant for a single occurrence, then each claimant shall pay a pro-rata share of the per occurrence deductible based upon the percentage of their paid claim to the total paid for insured. The City shall be entitled to 100% of its loss. Any portion of that loss not covered because of a deductible shall be paid to the City by the Contractor at the same time the proceeds of the insurance are paid to the City as trustee.

Any insured, other than the City, making claim to which a deductible applies shall be responsible for 100% of the loss not insured because of the deductible. Except as provided for under California law, the policy or policies shall provide that the City is entitled to 30 days prior written notice (10 days for cancellation due to non-payment of premium) of cancellation or non-renewal of the policy or policies.

7-3.2.6 Railroad Protective Liability Insurance. Exclusions relating to performance of operations within the vicinity of any railroad, bridge, trestle, roadbed, tunnel, underpass, or cross shall be deleted from all policies to which they may apply. Alternatively, the Contractor may provide separate Railroad Protective Liability insurance providing coverage, including endorsements, equivalent to that required for the CGL described herein.

ADD: 7-3.3 Rating Requirements. Except for the State Compensation Insurance Fund, all insurance required by this contract as described herein shall be carried only by responsible insurance companies with a rating of, or equivalent to, at least “A-, VI” by A.M. Best Company, that are authorized by the California Insurance Commissioner to do business in the State, and that have been approved by the City.

7-3.3.1 Non-Admitted Carriers. The City will accept insurance provided by non-admitted, “surplus lines” carriers only if the carrier is authorized to do business in the State and is included on the List of Eligible Surplus Lines Insurers (LESLI list).

All policies of insurance carried by non-admitted carriers shall be subject to all of the requirements for policies of insurance provided by admitted carriers described herein.

ADD: 7-3.4 Evidence of Insurance. The Contractor shall furnish to the City documents e.g., certificates of insurance and endorsements evidencing the insurance required herein, and shall furnish renewal documentation prior to expiration of this insurance. Each required document shall be signed by the insurer or a person authorized by the insurer to bind coverage on its behalf. The City reserves the right to require complete, certified copies of all insurance policies required herein.

ADD: 7-3.5 Policy Endorsements.

7-3.5.1 Commercial General Liability Insurance

7-3.5.1.1 Additional Insured. The Contractor shall provide at its expense policy endorsement written on the current version of the ISO Occurrence form CG 20 10 11 85 or an equivalent form providing coverage at least as broad.

To the fullest extent allowed by law e.g., California Insurance Code §11580.04, the policy shall be endorsed to include the City and its respective elected officials, officers, employees, agents, and representatives as additional insured. The additional insured coverage for Projects for which the Engineer’s Estimate is \$1,000,000 or more shall include liability arising out of: (a) Ongoing operations performed by the Contractor or on the Contractor’s behalf, (b) Your products, (c) Your work, e.g., the Contractor’s completed operations performed by the Contractor or on the Contractor’s behalf, or (d) premises owned, leased, controlled, or used by the Contractor; the coverage for Projects for which the Engineer’s Estimate is less than \$1,000,000 shall include liability arising out of: (a) Ongoing operations performed by the Contractor or on the Contractor’s behalf, (b) Your products, or (c) premises owned, leased, controlled, or used by the Contractor.

7-3.5.1.2 Primary and Non-Contributory Coverage. The policy shall be endorsed to provide that the coverage with respect to operations, including the completed operations, if appropriate, of the Named Insured is primary to any insurance or self-insurance of the City and its elected officials, officers, employees, agents and representatives. Further, it shall provide that any insurance maintained by the City and its elected officials, officers, employees, agents and representatives shall be in excess of the Contractor’s insurance and shall not contribute to it.

7-3.5.1.3 Project General Aggregate Limit. The policy or policies shall be endorsed to provide a Designated Construction Project General Aggregate Limit that will apply only to the Work. Only claims payments which arise from the Work shall reduce the Designated Construction Project General Aggregate Limit. The Designated Construction Project General Aggregate Limit shall be in addition to the aggregate limit provided for the products-completed operations hazard.

7-3.5.2 Commercial Automobile Liability Insurance.

7-3.5.2.1 Additional Insured. Unless the policy or policies of Commercial Auto Liability Insurance are written on an ISO form CA 00 01 12 90 or a later version of this form or equivalent form providing coverage at least as broad, the policy shall be endorsed to include the City and its respective elected officials, officers, employees, agents, and representatives as additional insured, with respect to liability arising out of automobiles owned, leased, hired or borrowed by or on behalf of the Contractor. This endorsement is limited to the obligations permitted by California Insurance Code §11580.04.

7-3.5.3 Contractors Pollution Liability Insurance Endorsements.

7-3.5.3.1 Additional Insured. The policy or policies shall be endorsed to include as an Insured the City and its respective elected officials, officers, employees, agents, and representatives, with respect to liability arising out of: (a) Ongoing operations performed by the Contractor or on the Contractor's behalf, (b) the Contractor's products, (c) the Contractor's work, e.g., the Contractor's completed operations performed by the Contractor or on the Contractor's behalf, or (d) premises owned, leased, controlled, or used by the Contractor; Except that in connection with, collateral to, or affecting any construction contract to which the provisions of subdivision (b) of § 2782 of the California Civil Code apply, this endorsement shall not provide any duty of indemnity coverage for the active negligence of the City and its respective elected officials, officers, employees, agents, and representatives in any case where an agreement to indemnify the City and its respective elected officials, officers, employees, agents, and representatives would be invalid under subdivision (b) of §2782 of the California Civil Code.

In any case where a claim or loss encompasses the negligence of the Insured and the active negligence of the City and its respective elected officials, officers, employees, agents, and representatives that is not covered because of California Insurance Code §11580.04, the insurer's obligation to the City and its respective elected officials, officers, employees, agents, and representatives shall be limited to obligations permitted by California Insurance Code §11580.04.

7-3.5.3.2 Primary and Non-Contributory Coverage. The policy or policies shall be endorsed to provide that the insurance afforded by the Contractors Pollution Liability Insurance policy or policies is primary to any insurance or self-insurance of the City and its elected officials, officers, employees, agents and representatives with respect to operations including the completed operations of the Named Insured. Any insurance maintained by the City and its elected officials, officers, employees, agents and representatives shall be in excess of the Contractor's insurance and shall not contribute to it.

7-3.5.3.3 Severability of Interest. For Contractors Pollution Liability Insurance, the policy or policies shall provide that the Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability and shall provide cross-liability coverage

7-3.5.4 Contractors Hazardous Transporters Pollution Liability Insurance Endorsements.

7-3.5.4.1 Additional Insured. The policy or policies shall be endorsed to include as an Insured the City and its respective elected officials, officers, employees, agents, and representatives, with respect to liability arising out of: (a) Ongoing operations performed by the Contractor or on the Contractor's behalf, (b) the Contractor's products, (c) the Contractor's work, e.g., the Contractor's completed operations performed by the Contractor or on the Contractor's behalf, or (d) premises owned, leased, controlled, or used by the Contractor; Except that in connection with, collateral to, or affecting any construction contract to which the provisions of subdivision (b) of §2782 of the California Civil Code apply, this endorsement shall not provide any duty of indemnity coverage for the active negligence of the City and its respective elected officials, officers, employees, agents, and representatives in any case where an agreement to indemnify the City and its respective elected officials, officers, employees,

agents, and representatives would be invalid under subdivision (b) of §2782 of the California Civil Code.

In any case where a claim or loss encompasses the negligence of the Insured and the active negligence of the City and its respective elected officials, officers, employees, agents, and representatives that is not covered because of California Insurance Code §11580.04, the insurer's obligation to the City and its respective elected officials, officers, employees, agents, and representatives shall be limited to obligations permitted by California Insurance Code §11580.04.

7-3.5.4.2 Primary and Non-Contributory Coverage. The policy or policies shall be endorsed to provide that the insurance afforded by the Contractors Pollution Liability Insurance policy or policies is primary to any insurance or self-insurance of the City and its elected officials, officers, employees, agents and representatives with respect to operations including the completed operations of the Named Insured. Any insurance maintained by the City and its elected officials, officers, employees, agents and representatives shall be in excess of the Contractor's insurance and shall not contribute to it.

7-3.5.4.3 Severability of Interest. For Contractors Hazardous Transporters Pollution Liability Insurance, the policy or policies shall provide that the Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability and shall provide cross-liability coverage.

7-3.5.5 Builders Risk Endorsements.

7-3.5.5.1 Waiver of Subrogation. The policy or policies shall be endorsed to provide that the insurer will waive all rights of subrogation against the City, and its respective elected officials, officers, employees, agents, and representatives for losses paid under the terms of the policy or policies and which arise from work performed by the Named Insured for the City.

7-3.5.5.2 Builders Risk – Partial Utilization. If the City desires to occupy or use a portion or portions of the Work prior to Acceptance in accordance with this contract, the City shall notify the Contractor and the Contractor shall immediately notify its Builder's Risk insurer and obtain an endorsement that the policy or policies shall not be cancelled or lapse on account of any such partial use or occupancy. The Contractor shall obtain the endorsement prior to the City's occupation and use.

ADD: 7-3.6 Deductibles and Self-Insured Retentions. The Contractor shall be responsible for the payment of all deductibles and self-insured retentions. Deductibles and self-insured retentions shall be disclosed to the City at the time the evidence of insurance is provided.

ADD: 7-3.7 Reservation of Rights. The City reserves the right, from time to time, to review Contractor's insurance coverage, limits, deductibles and self-insured retentions to determine if they are acceptable to the City. The City will reimburse Contractor, without overhead, profit, or any other markup, for the cost of additional premium for any coverage requested by the City but not required by this contract.

ADD: 7-3.8 Notice of Changes to Insurance. The Contractor shall notify the City 30 days prior to any material change to the policies of insurance provided under this contract.

ADD: 7-3.9 Excess Insurance. Policies providing excess coverage shall follow the form of the primary policy or policies e.g., all endorsements.

ADD: 7-3.10 Architects and Engineers Professional Insurance (Errors and Omissions Insurance) – For contracts with required engineering services (e.g., Design-Build, preparation of engineered Traffic Control Plans (TCP), etc. by the Contractor) for all of the Contractor's employees or Subcontractors who provide professional engineering services under this contract, the Contractor shall keep or shall

require its Subcontractor in full force and effect, Professional Liability coverage with a limit of \$1,000,000 per claim and \$2,000,000 annual aggregate.

The Contractor shall ensure both that: (a) the policy retroactive date is on or before the date of commencement of the Project; and (b) the policy will be maintained in force for a period of three years after completion of the Project or termination of this contract whichever occurs last. The Contractor agrees that for the time period defined above, there will be no changes or endorsements to the policy that affect the coverage provided herein

If professional engineering services are to be provided solely by a subcontractor, the Contractor shall (a) certify this to the City in writing and (b) agree in writing to require the Subcontractor to procure Professional Liability coverage in accordance with the requirements set forth above.

7-4 WORKERS' COMPENSATION INSURANCE.

DELETE in its entirety and SUBSTITUTE with the following:

7-4.1 Workers' Compensation Insurance and Employers Liability Insurance. In accordance with the provisions of §3700 of the California Labor Code, the Contractor shall provide at its expense Workers' Compensation Insurance and Employers Liability Insurance to protect the Contractor against all claims under applicable state workers compensation laws. The City, its elected officials, and employees will not be responsible for any claims in law or equity occasioned by the failure of the Contractor to comply with the requirements of this section. Limits for this insurance shall be not less than the following:

<u>Workers' Compensation</u>	<u>Statutory Employers Liability</u>
Bodily Injury by Accident	\$1,000,000 each accident
Bodily Injury by Disease	\$1,000,000 each employee
Bodily Injury by Disease	\$1,000,000 policy limit

By signing and returning this contract the Contractor certifies that the Contractor is aware of the provisions of §3700 of the Labor Code which require every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that code and the Contractor will comply with such provisions before commencing the performance of the work of this contract as required by § 1861 of the California Labor Code.

7-4.1.1 Workers' Compensation Insurance for Work In, Over, or Alongside Navigable Waters. In addition to the Workers' Compensation Insurance required under the General Conditions of this contract, the Contractor shall provide additional insurance coverage for claims brought under the Longshore and Harbor Workers' Compensation Act, the Jones Act, general maritime law, and any other federal or state laws, resulting from the Contractor's work in, over, or alongside navigable waters.

7-4.2.1 Waiver of Subrogation. The policy or policies shall be endorsed to provide that the insurer will waive all rights of subrogation against the City, and its respective elected officials, officers, employees, agents, and representatives for losses paid under the terms of the policy or policies and which arise from work performed by the Named Insured for the City.

7-5 PERMITS. DELETE in its entirety and SUBSTITUTE with the following:

7-5 PERMITS, FEES, AND NOTICES. The Contractor shall obtain and pay for all business taxes, permits, and fees required for constructing the Project and licenses and inspections necessary for the proper execution and completion of the Work **unless specified otherwise in the Contract Documents**.

- a) To the extent there is a change in the type or cost of any of such permits, fees, licenses, or inspection occurring after Award of Contract, there shall be an equitable adjustment in the Contract Price on account of such change under Extra Work provisions.
- b) The Contractor shall comply with and give notices required by applicable laws. The Contractor shall not be entitled to damages or additional payment for delays attributable to the acquisition of permits.
- c) The Contractor may be given a no-cost extension of time for unforeseen delays attributable to the acquisition of permits.
- d) The Contractor shall provide and pay for all utilities e.g., electrical, gas, and water required for construction activities (e.g., testing and commissioning and vegetation maintenance) until the Work is accepted.
- e) The Contractor shall pay or reimburse the City for regulatory or court imposed fees, fines, or penalties imposed on the City arising from the Contractor's failure to complete the Work in accordance with the Contract Documents. The Contractor's responsibility and obligation to pay or reimburse the City for these fees, fines, or penalties shall be in addition to the assessment of liquidated damages for late completion of the Work.

For Private Contracts, the Contractor shall obtain all permits incidental to the Work or made necessary by its operations, and pay all costs incurred by the permit requirements.

ADD: 7-5.1 Building Permits. The Contractor shall obtain the required building permits from the DSD. Any prior approval obtained for the Plans will not in any way waive this requirement.

The Contractor shall be required to request inspections in accordance with the building codes in effect on the permitted plans and by the DSD. These inspections will be coordinated at all times through the Engineer. Any work performed without the benefit of the required permit and subsequent inspection shall be removed and replaced at the discretion of the Inspector at no additional cost to the City.

ADD: 7-5.2 Caltrans Encroachment Permit. When specified in the SSP, the City has applied for the Caltrans Encroachment Permit and the Contractor shall be responsible for paying for and securing the permit prior to construction. The Contractor shall be responsible for arranging and paying for inspection as required by Caltrans.

Prior to the pre-construction meeting and for Work in areas subject to Caltrans permitting, the Contractor shall submit 8 collated, stapled sets of traffic control Working Drawings to the City Project Manager. Traffic control Working Drawings shall be drawn in compliance with the 2006 California MUTCD. Caltrans right of way boundaries shall be shown on the plans. The City will apply for a "parent" permit which may take 3 to 6 weeks to receive.

Paving Work at these locations shall not be scheduled until the Contractor acquires the Caltrans "over the counter" permit using the City's "parent permit". The Contractor shall be solely responsible for permit processing delays that result from incomplete or inaccurate drawings.

7-5.3 Payment. The payment for applying for and obtaining the required permits shall be included in the various Bid items **unless a Bid item has been provided**. An Allowance Bid item has been provided for Caltrans Encroachment Permit and fees.

ADD: 7-6.1 Project Meetings. The Contractor's representatives e.g., field supervisor, superintendent, and project manager, shall attend scheduled construction meetings as required by the Engineer. If any of the Contractor's staff cannot attend, the Contractor shall notify the Engineer a minimum of 24 hours

in advance, prior to the start of the scheduled meeting. If the Contractor does not provide the required notification the Contractor shall be financially responsible for the costs of the City staff, consultants, or both that attend. The Contractor will be charged a minimum of 2 hours of the Engineer's time plus the time of other City employees or representatives that attend the meeting.

7-6.1.1 Payment. The payment for the Contractor's attendance of Project meetings shall be included in the various Bid items. All costs assessed to the Contractor for not attending the meetings will be deducted from the monthly invoice.

7-8.1 General. ADD the following:

A self-loading motorized street sweeper equipped with a functional water spray system shall be required for this project.

7-8.6.1 General. ADD the following:

The Contractor shall comply with the requirements of the CGP or Municipal Permit as applicable for any construction or demolition activity that results in a land disturbance.

7-8.6.3 Storm Water Pollution Prevention Plan (SWPPP). DELETE in its entirety and SUBSTITUTE with the following:

For projects subject to CGP, the Contractor shall prepare, submit, and implement a SWPPP in accordance with Section 801, "WATER POLLUTION CONTROL."

ADD: 7-8.7 Graffiti Control. The Contractor shall maintain Site improvements, including any temporary facilities, equipment or other materials free of graffiti. Graffiti encountered on the Site shall be removed by the Contractor within 24 hours.

The payment for graffiti removal shall be included in other items of Work.

ADD: 7-8.8 Payment. If no separate Bid item(s) has(ve) been provided for the items of Work involving Work Site maintenance, payment shall be included in the various Bid items.

7-9 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS. ADD the following:

The City reserves the right to repair damages to City facilities caused by the Contractor's operations at the Contractor's expense.

The Contractor shall be responsible for coordinating with property owners for access to be provided to work on the private property or the City's right-of-way.

ADD: 7-9.1 Video Recording Of Pre-existing Conditions. The purpose of the video recording of the pre-existing Site conditions is to document the Site deficiencies for which the Contractor shall not be responsible. The Contractor shall video record pre-existing conditions of the Site prior to any construction activities such as:

- a) Property markers.
- b) Right-of-Way and easement conditions.
- c) Utility markings.
- d) Survey conditions.
- e) Pavement conditions, markings, and striping.
- f) Adjacent property conditions.
- g) Sidewalk, median, curb, and gutter conditions.
- h) Safety conditions.

- i) Unusual conditions or equipment.
- j) Existing canyon conditions (including vegetation) along the pipe corridor.

The Contractor shall turn over video discs to the Engineer no later than 5 Working Days after NTP.

7-9.1.1 Payment. Payment for video recording services shall be included in the Bid item for "Video Recording of Pre-existing Conditions." If there is no Bid item, payment shall be included in the various Bid items.

ADD: 7-9.2 Placements and Removal of Markouts. Markouts refer to the temporary marking or painting of the ground, pavement, or sidewalk by the facility or utility owner or its representative for the convenience of the Contractor.

Markouts shall not be placed in the public right-of-way more than 30 days prior to the commencement of excavation work perform in connection with an installation.

Markouts shall be removed from all surfaces in the public right-of-way, including decorative surfaces, within 30 days of the completion of the excavation work, if the work is completed.

ADD: 7-9.3 Existing Pavement Markers and Striping. The Contractor shall record the location and conditions of the existing pavement markers and striping prior to construction and submit to the Engineer in accordance with 2-5.3, "Submittals." Permanent pavement markers and striping removed or damaged during construction shall be replaced in kind or as noted on the Plans at the Contractor's expense.

ADD: 7-9.4 Payment for Planned Damages. Restoration of the improvements damaged as part of the Work shall be included in the Work requiring the damage to the improvements.

7-10.1 Traffic and Access. Fifth paragraph, DELETE in its entirety and SUBSTITUTE with the following:

The Contractor shall cooperate with the various parties involved in the delivery of mail and the collection of trash, recycling, and yard waste to maintain existing schedules for these services.

The Contractor shall comply with the following requirements for trash, recycling, and yard waste collection:

- a) Provide advance written notice to every property affected by blocked public right of way.
- b) Coordinate the relocation of trash, recycling, and yard waste containers to an accessible public street for the City's waste collection crews on collection day.
- c) When necessary relocate the containers from the blocked streets to the accessible public right of way before the City's collection vehicles arrive to assist with collection on existing schedules. The Contractor shall return the containers to their point of origin to ensure the accuracy of inventory assignment by address.

The Contractor may verify waste collection schedules via the Environmental Services website at <http://www.sandiego.gov/environmental-services/collection/schedules.shtml>. The Contractor shall notify Environmental Services Department via fax (858-526-2356) of street closures affecting the regular scheduled solid waste collection at least 3 Working Days prior to the street closure. Notification shall include contact name and phone number, day(s) of closure, time of scheduled closure, and date of anticipated street reopening.

If the City crews are unable to provide the citizens with the mandated services due to the Contractor's failure to comply with theses specifications, the Contractor shall be required to collect trash,

recyclables, and yard waste on the City designated schedule and deliver to the City designated locations, or arrange to have a private franchise hauler provide the collection service at the Contractor's expense.

Before the last paragraph, ADD the following:

The term "Railroad" shall mean the San Diego Metropolitan Transit System (MTS) and the San Diego Arizona & Eastern Railroad (SDA&E).

The Contractor's right to enter right-of-way owned, operated, occupied, and/or controlled by Railroad shall be subject to the absolute right of Railroad to cause the Contractor's work to cease if, in the opinion of Railroad, Contractor's activities create a hazard to Railroad's patrons, employees, and operations.

The Contractor shall obtain a Right of Entry Permit from Railroad prior to entering or constructing on property owned, operated, occupied, and/or controlled by the Railroad. The Contractor shall abide by the terms of the Right of Entry Permit and arranging and paying for inspection as required by the Railroad. The terms of the Right of Entry Permit shall govern if there are any conflicts with the Plans and Specifications.

Information on obtaining a Right of Entry Permit and regarding MTS policies can be obtained at <http://www.sdmts.com/business/permits/asp> or by calling MTS Right of Way Services at 619-557-4501.

The Contractor shall notify San Diego Transit, a minimum of 5 Working Days prior to excavation, construction, or traffic control affecting bus stops. The Contractor shall notify the following agencies a minimum of two 2 Working Days prior to construction activities affecting the agencies:

Fire Department Dispatch	(Street or alley closure)	(858) 573-1300
Police Department Traffic	(Street or alley closure)	(858) 495-7800
Street Division/Electrical	(Traffic signals)	(619) 527-7500
U.S. Navy	(32 nd Street Naval Station)	(619) 556-1319
Underground Service Alert	(Any excavation)	(800) 422-4133
MTDB	(Street Closure)	(619) 557-4549

If Work is located within the flight path of aircrafts landing or taking off at San Diego airports, a construction permit shall be obtained for tall equipment (e.g., cranes) through Federal Aviation Administration (FAA).

Where Work occurs on Harbor Drive or impacts traffic flow to San Diego International Airport (Airport) from adjacent and contiguous streets such as Pacific Highway, Laurel Street, Grape Street, Hawthorn Street, and Nimitz Blvd. the Contractor shall perform the following:

- a) Notify the San Diego County Regional Airport Authority (Authority) Public, Community, and Customer Relations Department of the intended Work and scheduled duration a minimum of 5 Working Days prior to commencement of the Work. Telephone No. 619-400-2880.
- b) Coordinate the Work with the Authority's designated representative(s) to minimize impact to the travelling public and operations of the Airport a minimum of 5 Working Days prior to commencement of the Work.
- c) **When included in the Contract Documents or specified on the approved TCP** adjust the Schedule to take advantage of the reduced Airport operations and low vehicular traffic on Harbor Drive and surrounding streets between the hours of 11:00 pm and 5:30 am Monday through Sunday.

- d) Do not interrupt access to the Airport.

Payment for traffic and access as specified in this subsection and the railroad liability insurance, permits, plan review, inspection, flagging, and fees shall be included in the various Bid items **unless a Bid item has been provided.**

ADD: 7-10.2 Traffic Control.

7-10.2.1 Traffic Control Working Drawings. For those portions of the Work where “D” size engineered TCP are not provided nor required, the Contractor shall prepare traffic control Working Drawings.

The Contractor shall prepare and submit traffic control Working Drawings, in accordance with the City’s Computer Aided Design and Drafting (CADD) standards and 2-5.3, “Submittals” to the Engineering Traffic Control Section. The Contractor may use any standard engineering CADD program e.g., MicroStation and AutoCAD to prepare TCP. The Working Drawings shall be of a size and scale to clearly show all necessary details. The traffic control Working Drawing shall be site-specific. Typical plans and sections will not be accepted.

The Contractor shall allow a minimum of 20 Working Days for review of the Working Drawings. If extensive additions or corrections are required, the Engineering Traffic Control Section will return the marked-up print for corrections and re-submission. If no change or correction is required, the original Working Drawings will be retained by the Engineer. One copy, with the TCP Permit attached, will be returned to the Contractor. No extension of time will be allowed as a result of the Contractor’s failure to properly produce traffic control Working Drawings and to schedule the Work.

7-10.2.2 Engineered Traffic Control Plans Provided by the Contractor. **If the Contract Documents require “D” size i.e., engineered TCP,** the Contractor shall submit the “D” sheet TCP’s in accordance with 2-5.3. The engineered TCP shall be prepared by a Professional Engineer (i.e., Traffic or Civil) registered in the State of California.

The drawings shall be prepared in accordance with the City’s CADD standards. The Contractor may use any standard engineering CADD program e.g., MicroStation and AutoCAD to prepare TCP. TCP shall be site specific. Typical plans and sections will not be accepted.

The Contractor shall coordinate with the City’s Traffic Control Section of the Field Engineering Division for the development and approval of the TCP. A Traffic Control Approach shall be approved by the City prior to the Contractor preparing the TCP. A list of traffic control items is available upon request from the Field Engineering Division as a guideline. TCP shall be prepared in accordance with the Traffic Control Approach. A copy of the Project area base map may be obtained through the Engineer or via the following web link: www.basemap.com.

The Contractor shall allow a minimum of 20 Working Days for City’s review of each TCP submitted in accordance with 2-5.3, “Submittals.” If extensive additions or corrections are required, the Traffic Control Section will return the marked-up print for corrections and re-submission. If no changes or corrections are required, the original engineered drawings will be retained by the Traffic Control Section. One copy, with the TCP Permit attached, will be returned to the Contractor. No extension of time will be allowed as a result of the Contractor’s failure to properly produce TCP and to schedule the Work.

Architects and Engineers Professional Insurance in accordance with 7-3.10, “Architects and Engineers Professional Insurance (Errors and Omissions Insurance)” shall be required for Work including engineered “D” size TCP by the Contractor.

7-10.2.3 Traffic Control Permit. The Work shall not begin in the public roadway without the approved traffic control permit. The traffic control plans, including any as part of the Plans or developed by the Contractor, are not valid until Work dates are approved and a traffic control permit is issued by the City.

The Contractor shall coordinate the traffic control permit application submittal with the Work so that no items of Work will be delayed. To obtain a traffic control permit, the Contractor shall call the Engineering Traffic Control Section, (858) 495-4741 for an appointment a minimum of 2 Working Days prior to starting Work (5 Working Days when the Work will affect a traffic signal). The Contractor shall provide 2 copies of the traffic control drawings as provided in the Contract Documents or prepared by the Contractor at the time of the appointment. Upon approval of the Contractor's plans, the Traffic Control Section of the Field Engineering Division will issue the permit.

7-10.2.4 Traffic Control Devices. The Contractor shall furnish, install, and maintain the traffic control devices as shown on the traffic control permit and approved TCP's, and any additional traffic control devices as may be required to ensure the safe movement of vehicles and pedestrians, and to provide for the safety of construction workers. The Contractor shall maintain existing traffic control signs and traffic signals in their proper location on temporary mounting supports until permanent signs or signals are restored. The Contractor shall use traffic control devices in accordance with the latest California MUTCD. The name of the Contractor or Supplier who owns the traffic control devices shall be clearly noted on each device.

Barricades used at night shall be equipped with flashing lights. Signs used at night shall be reflectorized with a material that has a smooth, sealed outer surface, or illuminated to show approximately the same shape and color day and night. Internally or externally illuminated signs shall be used where there is significant interference from extraneous light sources and reflectorized signs will not be effective. External light sources shall be properly shielded to protect drivers from glare. Street lighting is not adequate for sign illumination.

Traffic control devices shall conform to the following **unless shown otherwise** on the traffic control permit:

- a) The working hours shall be the Normal Working Hours **unless specified otherwise**. If construction is to be performed in phases; Work shall be completed in each phase prior to beginning the Work in the next phase. Approval of traffic drawings for hours outside of the Normal Working Hours does not constitute a guarantee that inspection will be available in accordance with 2-11, "INSPECTION."
- b) Equipment, material, or debris shall not be stored or remain in the public right-of-way without prior approval by the Engineer.
- c) Travel lanes shall be 12' wide, minimum. For lane closures on roadways with bike lanes, the rightmost travel lane shall be fourteen 14' wide, minimum.
- d) Flashing arrow boards shall be used when the posted speed is 40 mph or more, or when curvature of the roadway limits visibility.
- e) The Contractor shall maintain cross traffic and turning moves at the intersections.
- f) Trenches shall be backfilled or trench-plated at the end of each work day. An asphalt ramp shall be placed around each trench plate to prevent the plate from being dislodged. Upon completion of excavation backfill, the Contractor shall provide a satisfactory surface for traffic. Portable concrete barrier (K-rail), additional noticing, and other items may be required when trenching cannot be secured overnight by backfilling or trench-plating.

- g) The Contractor shall repair or replace traffic control devices, loop detectors, and traffic signal equipment damaged or removed as a result of operations and not designated for removal. Repairs and replacements shall be equal to existing improvements. Loop detectors shall be replaced within 3 Working Days of completion of underground work.
- h) The Contractor may use the parking lane while working next to the curb. The Contractor shall post "TOW-AWAY/NO PARKING" signs 24 hours in advance for temporary parking removal. Signs shall indicate specific days, dates, and times of restrictions. If violations occur, the Contractor shall call Police Dispatch 619-531-2000 to enforce the Tow-Away notice.
- i) The Contractor shall provide for a safe 4-foot wide pedestrian walkway along entire length of construction area.
- j) Access to private property shall be maintained to the greatest extent practicable. The Contractor shall minimize the time periods that driveways will be closed, and shall minimize inconvenience to the driveway users. When a driveway or pedestrian access is to be closed, the Contractor shall notify the property owner and tenants a minimum of 5 Working Days prior to closure, and shall explain to the owner or occupant when the closure is to start and how long the Work will take. The Contractor shall obtain the Engineer's approval of the notice format prior to notice release.
- k) The Contractor shall post signs notifying the public a minimum of 5 Working Days prior to closure, or detour, of streets.
- l) The Contractor shall maintain full width of all traffic lanes of the existing roadway during non-working hours and on Saturday, Sunday, designated holidays, and when construction operations are not actively in progress on Working Days. The Contractor shall keep the streets in and adjacent to the construction area clean.
- m) When constructing a new roadway, the Contractor is to install and maintain Type III barricades with flashing yellow lights and "Road Closed" signs, chain link fences, or both until the new or improved roadway is accepted by the Engineer.

The Contractor shall submit proposed changes to and deviations from the traffic control plan permit for the Engineer's approval. Prior to implementation, the Engineer will observe the implementation of traffic control plans and reserves the right to require the Contractor to make changes as field conditions warrant. The Engineer may approve the changes to the traffic control plan permit or if directed in writing by the Engineer, the Contractor shall call the Traffic Control Section at (858) 495-4741, for an appointment, to request a revision to the traffic control plan permit. Such changes shall supersede the original traffic control plan permit.

7-10.2.5 Traffic Control for Resurfacing and Slurry Sealing. Temporary reflective pavement markers shall be placed on all roadways with painted centerline immediately upon completion of the resurfacing or slurry sealing and shall be removed only for new permanent pavement striping.

7-10.2.6 Traffic Control Signs and Notices for Resurfacing and Slurry Sealing. The City will provide the Contractor, at the Pre-Construction Meeting, the standard format for "NO PARKING - TOW-AWAY ZONE" signs for the resurfacing and/or slurry seal portion of the Work. The Contractor shall furnish the "NO PARKING - TOW-AWAY ZONE" signs and pedestals for posting on sidewalks and streets. The "NO PARKING - TOW-AWAY ZONE" signs shall be mounted on suitable pedestals, such as tripods and barricades. Signs shall be posted every 50' on both sides of the block affected by the proposed resurfacing, slurry sealing, or both.

The Contractor shall affix to each “NO PARKING - TOW-AWAY ZONE” sign cards with 2-inch high letters stating the day(s) of the week parking is prohibited, as well as the Contractor’s company name and telephone number. The “NO PARKING - TOW-AWAY ZONE” signs shall be removed immediately following the completion of the resurfacing, slurry sealing, or both.

For each street block segment scheduled for slurry sealing or resurfacing, the posted parking prohibition shall be for 2 consecutive Working Days. The Contractor shall schedule the slurry sealing on the first posted Working Day, unless approved by the Engineer. The second posted Working Day shall be reserved for emergency work, and may be used only with the approval of the Engineer. Street block segments which are not completed by the second posted Working Day shall be rescheduled. “NO PARKING - TOW-AWAY ZONE” signs shall be placed no less than 48 hours in advance and no more than 72 hours in advance of the scheduled slurry sealing. Street block segments which are not completed by the last posted Working Day shall be rescheduled. If a Work delay of 48 hours or more occurs from the originally scheduled Work date, the “NO PARKING - TOW-AWAY ZONE” signs shall be removed for a minimum of 24 hours, then reset and re-posted for the appropriate Work date.

The Contractor shall furnish and distribute door hanger notices in sufficient quantities to advise the general public of the scheduled parking prohibitions. The Contractor shall include the company name and telephone number on each door hanger notice. The Engineer shall approve the format of the door hanger notice prior to its distribution. The door hanger notices shall be left on or at the front door of each dwelling and apartment unit and at each tenant of commercial buildings abutting each of the street block segments to be slurry sealed or resurfaced. Where the front doors of apartment units are inaccessible, door hanger notices shall be distributed to the apartment manager or security officer. The Contractor shall deliver copies of the door hanger notice to a responsible party of commercial buildings, schools, hospitals, churches, and other public buildings. Door hanger notices shall be distributed no less than 48 hours in advance and no more than 72 hours in advance of the scheduled resurfacing.

7-10.2.7 Measurement and Payment. Payment for traffic control Working Drawings, “D” size TCP, and permits shall be included in the Bid item for Traffic Control Design. If no Bid item is provided, payment shall be included in the various items of Work.

Payment for traffic control devices and any required signs and notices, shall be included in the lump sum Bid item for the Traffic Control when provided in the Bid proposal. Traffic control devices which may be required by the City, not included as separate Bid items, shall be included in the payment. If no Bid item is provided, payment for traffic control devices shall be included in the various items of Work.

When included in the Bid proposal, the following traffic control devices will be measured and paid separately:

- a) K-rail will be measured and paid for per linear foot along the top of the rail per location. Maintaining, repairing, replacing, and removing the K-rail, excavation and backfill, drilling holes and grouting threaded rods or dowels when required, removing threaded rods or dowels and filling drilled holes with mortar, and moving and replacing removable panels as required, complete in place, as shown on the Plans, and in accordance with these specifications and the Special Provisions shall be included in the Bid item for K-rail.
- b) Crash cushion modules will be measured per each individual module (barrel), on a one-time basis, for each location shown on the plans. Maintaining, repairing, replacing, and removing the modules, complete in place, as shown on the Plans and in accordance with these specifications and the Special Provisions shall be included in the Bid item for Crash Cushion Modules.

- c) Maintaining, repairing, replacing, and removing the flashing arrow boards, complete in place, as shown on the Plans, and in accordance with these specifications and the Special Provisions shall be included in the lump sum Bid item for Flashing Arrow Boards.
- d) Flashing arrow boards and electronic message signs shall be available for use 24 hours per day as required, without any additional payment for time or number of locations unless otherwise required for changed conditions.

7-10.3 Street Closures, Detours, Barricades. ADD the following:

Street closures, detours, barricades lights, other safety devices shall conform to current requirements covering "signs" as set forth by Caltrans.

The Contractor shall maintain, whether shown on the plan or not, existing traffic control signs or signals in their proper location on temporary mounting supports until permanent signs or signals are restored.

Traffic control safety devices shall have the owner's name clearly noted.

For the Work in the vicinity of the Airport as specified 7-10.1, "Traffic and Access", the Contractor shall perform the following:

- a) Work necessitating closure of 1 or more lanes on Harbor Drive shall be performed outside Normal Working Hours **unless specified otherwise** in the Contract Documents.
- b) When sufficient width is available, maintain a minimum of 2 travel lanes in each direction at all times unless specified otherwise in the Contract Documents or agreed upon by Airport representative(s).
- c) Construct and maintain detours at the proper time. Failure or refusal to construct and maintain detours as required shall be sufficient cause for closing down the Work.
- d) Do not interrupt the operation of the existing traffic signals and lighting unless **specified otherwise.**
- e) Whenever a portion of the roadway is completed, make that section of the road available to traffic immediately if it does not conflict with the rest of the traffic control devices and it does not compromise public safety.
- f) Furnish flaggers when required to give adequate warning to traffic or to the public of any dangerous conditions to be encountered.

The payment shall be included in the various items of Bid unless **specific Bid Item has been provided.**

7-10.4 Safety. ADD the following:

The Contractor shall be solely responsible for Site safety and security at all times and initiating, maintaining, and providing supervision of safety precautions and programs in connection with the Work.

- a) The Contractor shall designate a Competent Person as defined by Cal/OSHA.
- b) The Contractor shall furnish and install all necessary facilities to provide safe means of access to all points where Work is being performed.
- c) In non-emergency situations, the Contractor shall backfill trenches and restore roadway for safe night-time traffic usage. No open trenches shall be allowed overnight or during non-working hours unless prior written approval is received from the Engineer.

In emergencies affecting the safety or protection of persons or the Work or property at or adjacent to the Site, the Contractor, without special instruction or authorization from the City, is obligated to act to prevent threatened damage, injury or loss. The Contractor shall give the City prompt written notice if the Contractor believes that any significant changes in the Work have resulted because of the action taken in response to an emergency. If it is determined by the City that a change is required, a change may be authorized as Extra Work.

7-10.4.4 Confined Spaces (a) (1). DELETE in its entirety and SUBSTITUTE with the following:

1. Training of personnel including both the Contractor's and the Engineer.

ADD: 7-10.4.5 Health and Safety Plan. The Contractor bears the ultimate responsibility for the health and safety of its employees. These specifications shall not be construed to limit the Contractor's liability nor to assume that the City, its employees or designate, will assume any of the Contractor's liability associated with Site safety considerations. The Contractor shall have a health and safety plan in effect at least one week prior to commencement of Work. The plan shall meet all OSHA and other applicable requirements. The plan shall specifically address procedures and protocols that will be followed to monitor for the presence of hazardous atmosphere, possibility for engulfment, gasses due to organic soils or proximity to landfills, exposure to hazardous products such as may be released when grinding, cutting, or torching galvanized or painted surfaces, contaminated soil, and groundwater, and identify response actions that will be taken when these conditions are encountered. The City will not assume any role in determining the adequacy of the plan on behalf of the Contractor.

ADD: 7-10.4.6 Playground Safety. The Contractor shall provide a secured fence around the playground to prevent use or access. The fence shall not be removed until the independent Playground Safety Audit has been done by the Contractor and the City and the City has accepted the playground design and installation and the Punchlist items have been completed.

The Contractor shall provide a certification by a National Playground Safety Institute (NPSI) certified playground inspector that the installed equipment is compliant with all applicable codes.

The payment for fencing around the playground and the playground safety audit shall be included in the other Bid items **unless a Bid item has been provided.**

ADD: 7-10.4.8 Emergencies. If an emergency arises or appears imminent which may affect the Safety of persons or property, the Contractor shall act immediately to prevent and mitigate actual or threatened damage, injury or loss. Additional costs or extensions of time claimed by the Contractor on account of an emergency not caused by the fault or neglect of the Contractor will be paid as Extra Work.

ADD: 7-10.4.9 Emergency Contact. When trenching in paved streets the Contractor shall place, by spray paint or other method approved by the Engineer, their name and emergency telephone number adjacent to the sawcut line at intervals and location approved by the Engineer until the completion of the trench cap.

Payment shall be included in the price bid for pipeline work.

ADD: 7-10.4.10 Emergency Drills. The City's Risk Management Plan requires the Contractor to participate in the City's initiated emergency drills. The Contractor shall make itself familiar with the emergency evacuation routes and procedures in the event of an emergency. Drills are conducted annually and are scheduled a year in advance. Further information prior to bidding is available upon request from the City's Safety and Security Officer or the Facility Manager(s) for the facility(ies) included in the Project. The information includes a listing of dates for upcoming Emergency Evacuation Drills.

Activities shall be reflected in the Schedule. Approved delay times caused by unscheduled drills may be added to the Schedule and treated as Extra Work.

The payment shall be included in the various Bid items **unless a Bid item has been provided** for Emergency Drills.

ADD: 7-10.4.11 Concrete Forms, Falsework, and Shoring. The Contractor shall comply fully with the requirements of §1717 of the Construction Safety Orders, State Department of Industrial Relations, regarding the design of concrete forms, falsework and shoring, and the inspection of same before the placement of concrete. Where the said §1717 requires the services of a civil engineer registered in the State to approve design calculations and Working Drawings of the falsework or shoring system, or to inspect such system prior to placement of concrete, the Contractor shall employ a registered civil engineer for these purposes, and all costs therefore shall be included in the price named in the Contract for completion of the Work as set forth in the Contract Documents.

ADD: 7-10.5 Temporary Project Signs.

7-10.5.1 Street Name Signs. Upon completion of rough grading and prior to underground construction, temporary street name signs shall be provided and maintained at each intersection until the permanent street name signs have been placed.

Temporary street name signs shall be constructed and placed to the following minimum requirements:

- a) 5" high black lettering on 8"x 32" white blades.
- b) The bottom of the blades shall be a minimum of 7' above ground line, mounted on white 4"x 4" posts.
- c) Posts are to be placed radial to mid-point of curb returns, 15' in from the future face of curb.

7-10.5.2 Project Identification Sign. 1 to 4 signs shall be required. The City will provide the sign(s). The Contractor shall contact the Engineer to pick up the Project signs, install them at the Work location(s), and maintain them in a manner approved by the Engineer.

Project signs shall be displayed as follows:

- a) Utility Group Projects - A project identification sign and a project location sign shall be displayed at the beginning and ending of the street where construction is actively occurring.
- b) Open Sites - For a Work location(s) that are open and accessible to the public, the signs will be mounted on a standard Type II barricade and displayed everyday during work hours, then removed and stored during non-work hours.
- c) Secure and Confined Sites - For a Work location(s) that are closed and secure from public access, the signs will be continuously mounted, as directed by the Engineer, and displayed for the duration of the Contract.

The Contractor shall remove and return the signs to the City location as designated by the Engineer upon Acceptance.

7-10.5.3 Portable Changeable Message Signs (PCMS). Each portable changeable message sign unit shall consist of a controller unit, a power supply and a structural support system, all mounted on a trailer. The unit shall be assembled to form a complete self-contained portable changeable message sign which can be delivered to the Site and placed in immediate operation. The complete message sign unit shall be capable of operating in an ambient air temperature range of -4° F to 158° F and shall

not be affected by unauthorized mobile radio transmissions. The trailer shall be equipped so that it can be leveled and plumbed.

- a) The message displayed on the sign shall be visible from a distance of 1500' and shall be legible from a distance of 750', at noon on a cloudless day, by persons with vision of or corrected to 20/20. The sign panel shall be 3-line matrix and shall display not less than 7 characters per line. Sign messages to be displayed shall be as approved by the Engineer.
- b) The sign face shall be flat black and shall be protected from glare of the sun by a method which does not interfere with the clarity of the sign message. The sign shall be raised and lowered by means of a power driven lifting mechanism.
- c) The matrix sign shall be capable of complete alphanumeric selection.
- d) Lamp matrix type signs shall be equipped with an automatic dimming operational mode that automatically compensates for the influence of a temporary light source or other abnormal lighting conditions. The sign shall have manual dimming operation modes of 3 or more different lamp intensities.
- e) Matrix signs not utilizing lamps shall be either internally or externally illuminated at night.
- f) The controller unit shall be all solid-state containing all the necessary circuitry for the storage of at least 5 preprogrammed messages. The controller shall be installed in a location allowing the operator to perform all functions from one position. A keyboard entry system shall be provided to allow an operator to generate an infinite number of additional messages over the preprogrammed stored messages. The keyboard shall be equipped with a security lockout feature to prevent unauthorized use of the controller.
- g) The controller shall contain a nonvolatile memory to hold the keyboard created messages in memory during periods when the power is not activated. The controller shall provide for a variable message display rate which allows the operator to match the information display to the speed of the approaching traffic. The flashing off time shall be operator adjustable within the control cabinet.
- h) Full operation height shall be with the bottom of the sign at least 7' above the ground and the top no more than 14.5' above the ground.
- i) After initial placement, portable changeable message signs shall be moved from location to location as directed by the Engineer.
- j) Portable changeable message signs shall be furnished, placed, operated, and maintained at locations shown on the plans, **specified in the Special Provisions**, or designated by the Engineer.

7-10.5.4 Payment. Payment for temporary Project signs shall be included in the Bid item for Traffic Control. If no Traffic Control Bid item exists, payment shall be included in the various Bid items.

PCMS will be measured by the unit from actual count. The Bid item for PCMS shall include full compensation for furnishing, placing, operating, maintaining, repairing, replacing, transporting from location to location and removing the portable changeable message signs, as shown on the Plans, in accordance with these specifications, and the Special Provisions, and as directed by the Engineer. PCMS shall be available for use 24 hours per day as required, without any additional payment for time or number of locations unless otherwise required for changed conditions.

ADD: 7-10.6 Traffic Plate Bridging. The Contractor shall secure approval, in advance, from authorities concerned for the use of any bridges proposed by it for public use.

Transverse or longitudinal cuts in the right-of-way that cannot be properly completed within a workday shall be protected by structural steel plate bridging in such a way as to preserve unobstructed traffic flow. Structural steel plates placed over surface voids, such as trenches and other areas to be protected in the public right-of-way shall conform to the following:

Un-restored voids, trenches, holes, excavations, etc., that are in the pedestrian or traveled way shall be protected through the use of adequately designed barricades and structural steel plates that will support legal vehicle loads.

Structural steel plate bridging shall be designed for HS 20-44 truck loading in accordance with Caltrans Bridge Design Specifications Manual. See Table 1 - Trench Width / Minimum Plate Thickness.

Steel plates used for bridging shall extend a minimum of 12" (300mm) beyond the edges of the trench.

Plates shall provide complete coverage to prevent any person, bicycle, motorcycle or motor vehicle from being endangered due to plate movement causing separations or gaps. Plates shall be installed with the plate laid in reasonably flat plane and all vertical edges transitioned with asphaltic cold-mix or other acceptable ramping device(s) acceptable to the City.

Fine graded asphalt concrete shall be compacted to form ramps with a maximum slope of 8.5% and a minimum of 12" (300mm) taper to cover all edges of the steel plates.

Structural steel plates shall have a skid-resistant surface.

When steel plates are removed, any damage to the pavement shall be repaired with either graded fines of asphalt concrete mix, asphaltic cold mix, concrete slurry or equivalent slurry satisfactory to the Engineer.

The Contractor shall be responsible for maintenance of the structural steel bridging plates, shoring and asphalt concrete ramps.

The trench shall be adequately shored to support the bridging and traffic loads.

Steel Plate Bridging shall be secured against movement or displacement by using adjustable cleats, shims, welding, or other devices, and shall be installed to in a manner that will minimize noise.

When steel plates are placed within the public right of way:

- a) The Contractor's name and 24-hr phone number shall be visible, legible and permanently affixed on each plate or,
- b) The Contractor shall erect sign(s) in the immediate area of the trench plate(s) identifying the Contractors name with a 24-hr phone number. The minimum height of letters and numbers shall be two inches.

The Contractor shall immediately mobilize necessary personnel and equipment after being notified by the Engineer or the City's emergency service section of a repair needed. This includes, but is not limited to, plate anchors, cold-mix, asphalt concrete to transition/ramp from the existing roadway or sidewalk to the plate surface and back down.

Failure to respond to the emergency request within two hours will be grounds for the City repairs that will be invoiced at actual cost including overhead or \$500 per incident, whichever is greater. All Traffic Control Plans currently require prompt repairs of steel plating by the Contractor. Lack of Contractor

conformance may be automatic grounds for suspension of their permit, Contract, or both. For the minimum thickness of steel plate bridging refer to Table 7-10.6(A):

Table 7-10.6(A) - Trench Width / Minimum Plate Thickness

Trench Width	Minimum Plate Thickness
10" (0.25 m)	1/2" (13 mm)
1'-11" (0.58 m)	3/4" (19 mm)
2'-7" (0.80 m)	7/8" (22 mm)
3'-5" (1.04 m)	1" (25 mm)
5'-3" (1.6 m)	1 1/4" (32 mm)

For spans greater than 5'-3" (1.6 m), a structural design shall be prepared by a California Registered Civil Engineer and approved by the City.

A Rough Road sign (W33) with black lettering on an orange background may be used in advance of structural steel plate bridging.

Payment for steel plate bridging shall be included in the various Bid items **unless a Bid Item has been provided** for steel plate bridging.

ADD: 7-10.9 Site Maintenance.

7-10.9.1 Sanitation. **If required by the Special Provisions**, the Contractor shall provide and maintain enclosed toilets for the use of the Contractor and City's officers, employees or agents. The Contractor shall keep these accommodations in a neat and sanitary condition, and shall ensure they comply with all applicable laws, ordinances, and regulations pertaining to public health and sanitation of dwellings and camps.

7-10.9.2 Storage and Staging Areas. If the Plans designate a staging location within the Project or in close proximity, the Contractor shall utilize such area for their use. Otherwise, storage and staging areas shall be the responsibility of the Contractor. The storage and staging areas shall be as close as possible to the Site. The Contractor shall be responsible for obtaining any permits, leases, or any other items necessary to obtain staging areas.

Trash, oil dumping, storage of hazardous wastes, or construction equipment material and parking, fueling of equipment shall not be allowed in the MHPA or other biologically sensitive areas. The Contractor shall ensure the fueling of vehicles occurs only within designated staging areas using appropriate catch basins and devices.

The Contractor shall be responsible to return the storage and staging area and the adjacent area to an equal or better condition as deemed necessary by the Engineer, at no additional cost to the City.

7-10.9.3 Water for Construction Purposes. The Contractor shall purchase all water for construction e.g., water used for initial filling and final flushing of new pipeline, water used for Site maintenance, and maintenance of the vegetation and landscaping items of the Work. Only the 2.5" fire hydrant port may be used. The 4" port shall be free for use in the event of a fire.

Only the 2.5" fire hydrant port may be used. The 4" port shall be free for use in the event of a fire.

It shall be the Contractor's responsibility to obtain a meter and comply with the Fire Hydrant Meter Policy, Water Department Instruction, DI #55.27, dated April 21, 2000, and attached to the Contract. Violation of the requirements as set forth in the DI above shall be subject to fines or penalties pursuant to the City municipal code, §§67.15 and 67.37.

7-10.9.4 Payment. The payment for Site maintenance shall be included in the Bid item for Mobilization. If a pay item has not been established for Mobilization, the payment shall be included in the various Bid items.

7-12 ADVERTISING. ADD the following:

Any advertisement referring to the City as a user of a product, material, or service by the Contractor or any Subcontractor and Supplier is expressly prohibited without prior written approval of the City.

7-13 LAWS TO BE OBSERVED. ADD the following:

If the Contractor observes that the Plans, Specifications, or other portions of the Contract Documents are at variance with any laws, ordinances, rules or regulations, the Contractor shall promptly notify the Engineer in writing of such variance. The City will promptly review the matter and, if necessary, shall issue a Change Order or take any other action necessary to bring about compliance with the law, ordinance, rule or regulation in questions.

ADD: 7-13.1 Environmental & Safety Laws. Following is not an exhaustive list of the laws to be complied with by the Contractor. It is a partial list of some specific laws that the Contractor shall be aware of and comply with. They are added here for convenience as follows:

- a) Environmental Protection Agency regulations (40 CFR, Part 15).
- b) Clean Air Act of 1970, e.g., §306 (42 U.S.C. 7606), Executive Order 11738, prohibiting contracting with Clean Air Act violators; and §§608 and 609 (42 U.S.C. 7671g, 7671h) as amended November 15, 1990, prohibiting the intentional release of chlorofluorocarbons into the environment when performing Work.
- c) Clean Water Grant Program Bulletin 76A which augments the National Historic Preservation Act of 1966 (16 U.S.C. 470) as specified under §[01560], "Temporary Environmental Controls" of the General Requirements.
- d) CAL OSHA 5189 "Process Safety Management," CAL OSHA 3220 "Emergency Action Plan," Federal OSHA 29, CFR 1910, facilities Process Safety Management (PSM) manual, and the City's Risk Management Plan.
- e) California Title 8, § 5208 and § 1529, and Title 40 CFR Part 61.
- f) Flood Disaster Protection Act of 1973 (42 USC 4001 et seq, as amended).
- g) Senate Bill 198 and specifically shall have a written Injury Prevention Program on file with the City in accordance with all applicable standards, orders, or requirements of California Labor Code, §6401.7. This Program shall be submitted to the Engineer at the pre-construction meeting.
- h) State Energy Conservation Plan issued in compliance with the Energy Policy and Conservation Act (P.L. 94-163) as set forth in Division 15 of the Public Resources Code of the State.
- i) Clean Water Act (CWA) - The Federal Water Pollution Control Act enacted in 1972 by Public Law 92-500 and amended by the Water Quality Act of 1987. The Clean Water Act prohibits the discharge of pollutants to Waters of the United States unless said discharge is in accordance with an NPDES permit. The 1987 amendments include guidelines for regulating municipal, industrial, and construction storm water discharges under the NPDES program.

ADD: 7-13.2 Access for Disabled Persons. For Design-Build contracts, the Design-Builder shall warrant and certify that all Project Plans and Specifications prepared in accordance with this contract shall

meet all current requirements of the California Building Code, California Code of Regulations, Title 24 (Title 24) and Americans with Disabilities Act Accessibility Guidelines [ADAAG], and shall be in compliance with The Americans with Disabilities Act of 1990. When a conflict exists between Title 24 and ADAAG, the most restrictive requirement shall be followed. As a condition precedent to Award of this contract, the Design-Builder shall submit to City the Design-Builder Certification for Title 24/ADA Compliance.

The Design-Builder shall comply with all portions of Title 24 and the ADA. (For specific services and public accommodations, The Design-Builder may contact the Office of the Americans with Disabilities Act, Civil Rights Division, U.S. Department of Justice, P.O. Box 66118, Washington, D.C. 20035-6118; phone number (202) 514-0301.) The Design-Builder acknowledges and agrees that the Design-Builder is aware of and will comply with Council Policy 100-04, incorporated herein by this reference, adopted by Resolution No. R-282153, relating to the federally-mandated ADA. The Design-Builder and contractors will be individually responsible for administering their own ADA and Title 24 program.

The Design-Builder shall pay all claims, costs, losses and damages incurred by the City in undertaking remedial action to correct City determined violations of ADA or Title 24. To effectuate remedial action, the City will issue a Change Order incorporating the necessary revisions in the Construction Documents. The City will be entitled to an appropriate decrease in the Contract Price, and, if the Parties are unable to agree as to the amount thereof, The City may unilaterally issue the Change Order.

ADD: 7-15 INDEMNIFICATION AND HOLD HARMLESS AGREEMENT. The Contractor shall defend, indemnify, protect, and hold harmless the City, its agents, officers, and employees, from and against all claims asserted, or liability established for damages or injuries to any person or property resulting from the Contractor's action or failure to take the necessary measures to prevent such damages and injuries.

The Contractor shall be responsible for payment of any fines, reasonable attorneys' fees, and defense costs resulting from citations issued to the City by either the federal, state, or local environmental and safety enforcement agencies due to the Contractor's failure to abide by applicable safety, health, and environmental standards.

7-15.1 Low Bid Contracts (i.e., Non-Design-Build). The Contractor agrees to defend, indemnify, protect and hold City, its agents, officers and employees, harmless from and against any dispute between the Contractor and the Subcontractor should the City be made a party to any judicial or administrative proceeding and all claims asserted, or liability established for damages or injuries to any person or property including to the Contractor's employees, agents or officers, or judgments arising directly or indirectly out of obligations, work or services herein undertaken, which arise from, are connected with, are caused or claimed to be caused by the acts or omissions of the Contractor, its agents, officers and employees.

The obligation to indemnify shall be effective even if the City, its agents, officers or employees established passive negligence contributes to the loss or claim. The Contractor agrees that the City may elect to conduct its own defense or participate in its own defense of any claim related to this project. The Contractor's duty to indemnify and hold harmless shall not include any claims or liability arising from the established active or sole negligence, or sole willful misconduct of the City, its agents, officers or employees.

7-15.2 Design-Build Contracts.

7-15.2.1 Non-Design Services Indemnification and Defense. Other than in the performance of Services which shall be solely as addressed in these specifications, to the fullest extent permitted by law, the Design-Builder shall defend (with legal counsel reasonably acceptable to the City), indemnify

and hold harmless the City and its officers, agents, departments, officials, and employees [Indemnified Parties] from and against all claims, losses, costs, damages, injuries (including, without limitation, injury to or death of an employee of the Design-Builder or its Subcontractors), expense and liability of every kind, nature and description (including, without limitation, incidental and consequential damages, court costs, attorney's fees, litigation expenses and fees of expert consultants or expert witnesses incurred in connection therewith and costs of investigation) that arise out of, pertain to, or relate to, directly or indirectly, in whole or in part, any services (including, without limitation, construction services) performed under this contract by the Design-Builder, any Subcontractor, anyone directly or indirectly employed by them, or anyone that they control. The Design-Builder's duty to defend, indemnify, protect and hold harmless shall not include any claims or liabilities arising from the active negligence, sole negligence or willful misconduct of the Indemnified Parties.

7-15.2.2 Design Services Indemnification and Defense.

7-15.2.2.1 Design Services Indemnification. To the fullest extent permitted by law (including, without limitation, California Civil Code §2782.8), with respect to the performance of Services, the Design-Builder shall indemnify and hold harmless the City, its officers, or employees, from all claims, demands or liability that arise out of, pertain to or relate to the negligence, recklessness, or willful misconduct of the Design-Builder or the Design Builder's officers or employees and others hired or controlled by the Design-Builder.

7-15.2.2.2 Design Services Defense. Parties will work in good faith to procure applicable insurance coverage for the cost of any defense arising from all claims, demands or liability that arise out of, pertain to or relate to the negligence, recklessness, or willful misconduct of the Design-Builder or the Design-Builder's officers or employees.

7-15.2.3 Enforcement Costs. The Design-Builder agrees to pay any and all costs the City incurs enforcing the indemnity and defense provisions set forth in these specifications.

7-15.2.4 Insurance. The provisions of INDEMNIFICATION AND HOLD HARMLESS AGREEMENT shall not be limited by the requirements of Section 7-3, "LIABILITY INSURANCE" related to insurance.

7-15.2.5 Survival of Obligation. All representations, indemnifications, warranties and guarantees made in, required by or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive, completion and acceptance of the Work and termination or completion of the Contract.

ADD: 7-16 COMMUNITY LIAISON. The Contractor shall retain a community liaison representative throughout the Contract Time. The representative shall closely coordinate Work with the businesses, institutions and residents impacted by the Project. Duties shall include, but not be limited to, notification to the businesses, institutions and residents of the commencement of construction activities not less than 5 Working Days in advance, coordination of access for vehicular and pedestrian traffic to businesses, institutions and residences impacted by the Project, response to community questions and complaints related to the Contractor's activities, reporting of liaison activities at all Project progress meetings scheduled by the Engineer, attendance to the Project pre-construction meeting, and attendance at 2 community meetings.

The Contractor shall present their community liaison representative to the City, in writing, within 15 days of the award of the Contract.

7-16.1 PUBLIC NOTICE BY CONTRACTOR. The Contractor shall furnish and distribute public notices in the form of door hangers on city provided format to all occupants along streets where construction work is to be performed at least 1 week before starting work. For all work on private property, the

Contractor shall contact each owner individually a minimum of 15 days prior to the work. In the event the work has been delayed the Contractor shall re-notify residents of the new schedule of work.

7-16.2 Exclusive Community Liaison Services. **When additional public information and outreach services are specified in the Special Provisions,** the Contractor shall retain a community liaison for the Project whose sole responsibilities shall be as specified here:

- a) developing written list of follow-up information from community, tenants, and agencies,
- b) notification to the businesses, institutions and residents of the commencement of construction activities and utility service interruptions not less than 5 Working Days in advance,
- c) coordination of access for vehicular and pedestrian traffic to businesses, institutions and residences impacted by the Project,
- d) preparation and presentation of materials in coordination with the Engineer City's (standards and guidelines for the communication materials are available for review by Bidders by sending a request to E&CP PIO Group via the P&C Department),
- e) response to community questions and complaints related to the Contractor's activities,
- f) write, edit, update, or produce on-line brochures, pamphlets and news releases.
- g) standard telephone service and e-mail responses:
 - i. Respond to telephone calls and e-mails from residents.
 - ii. Record calls and e-mails on City tracking form or electronic tracking form.
 - iii. E-mail record of call information to Contractor and Project team.
- h) reporting of liaison activities at all Project progress meetings scheduled by the Engineer, attendance to the Project pre-construction meeting, and
- i) attendance at community and stakeholders meetings.

7-16.2.1 Community Liaison Work Plan. The Contractor shall present its community liaison and shall submit its community outreach plan (in writing and in accordance with 2-5.3, "Submittals") within 15 days of the award of the Contract. The work plan for the community liaison shall address the items of Work specified in these specifications.

7-16.3 Payment. The Payment for the community liaison shall be included in the Bid item for "Community Liaison" or "Exclusive Community Liaison Services" when provided as a separate Bid item." If no Bid item has been provided the payment shall be included in the various Bid items.

The payment for public notices shall be included in the various Bid items.

ADD: 7-17 NEWSLETTER. **When required in the Special Provisions,** the City plans to create and distribute a newsletter for this project. The Contractor shall provide the required information i.e., a written update on the progress of work, a 1 month look-ahead schedule, contact names and phone numbers, and any other information which may be of interest to the public for this purpose.

Payment shall be included in the various Bid items.

ADD: 7-18 DESIGN-BUILDER'S RESPONSIBILITIES. For Design-Build contracts, the Design-Builder shall keep the City informed of the progress and quality of the design and construction of the Project.

- a) The Design-Builder shall assume responsibility for all negligent errors, omissions, or acts arising from the design/architectural Services the Design-Builder provides under this contract, including any negligent errors, omissions, or acts of the Design-Builder's agents, officers, and employees.

b) The Design-Builder shall be responsible for coordinating all construction means, methods, techniques, sequences and procedures such as:

- i. Coordinate scheduling of Submittals, and all design and construction of the Project to ensure the efficient and orderly sequence of the construction. The Design-Builder shall monitor and report periodically to the City actual performance compared to Project Schedule. The Design-Builder shall prepare and submit to the City, during both the Design Phase and the Construction Phase, monthly progress reports, in a manner and format acceptable to the City, on the Work accomplished during the prior monthly period. Such reports shall be furnished at the time of submission of each monthly Application for Payment.

As part of such report, the Design-Builder shall provide an updated Schedule, including CPM illustrating the progress which has been made and specifically whether the Work is on schedule or behind schedule and actions being taken to correct Schedule slippage. The monthly report shall also set forth the Design-Builder's projected progress for the forthcoming month; and

- ii. Coordinate design and construction requirements with governmental agencies, utilities, and all other Parties either involved in infrastructure improvements or otherwise affected by the design and construction requirements.

Provide the City with 2 copies of all Submittals approved by the Design-Builder.

Assist the City's staff and reasonably cooperate with the City's legal, financial, design and construction consultants and all other designated representatives during the design and construction of the Project.

- iii. Implement suitable management systems and work plans for the Project relative to safety, quality assurance and managing and controlling the Work.
- iv. Be solely responsible for selecting the means, methods, techniques, sequences, or procedures of performing the Work. If the Design-Builder elects or chooses to adopt or follow, in whole or part, any means, means, methods, techniques, sequences or procedures of performing the Work developed or suggested by the City, the Design-Builder does so at its own risk and bears sole responsibility for such election or choice. The City will assume no responsibility thereof and in no way shall be held liable for any defects in the Work, or increased costs or delays in the Work, which may result from or be caused by the Design-Builder's use of such means, methods, techniques, sequences, or procedures.

ADD: 7-19 CONFLICT OF INTEREST. The Contractor shall establish and make known to its employees appropriate safeguards to prohibit employees from using their positions for a purpose that is, or gives the appearance of being, motivated by desire for private gain for themselves or others, particularly those with whom they have family, business, or other relationships. Project personnel shall not accept gratuities or any other favors from Subcontractors or potential Subcontractors.

The Contractor shall be subject to all federal, state and local conflict of interest laws, regulations, and policies applicable to public contracts and procurement practices, e.g., California Government Code §§1090, et. seq., and 81000, et. seq., and the City Ethics Ordinance, codified in the City Municipal Code at §§27.3501 to 27.3595. If, in performing the Services and/or Work set forth in this contract, the Contractor makes, or participates in, a "governmental decision" in accordance with title 2, §18701(a)(2) of the California Code of Regulations, or performs the same or substantially all the same

duties for City that would otherwise be performed by a City employee holding a position specified in the applicable department's conflict of interest code, the Contractor shall be subject to a conflict of interest code requiring the completion of one or more statements of economic interests disclosing the Contractor's relevant financial interests.

Statements of economic interests shall be made on Fair Political Practices Commission Form 700 and filed with the City Clerk. The Contractor shall file a Form 700 (Assuming Office Statement) within 30 days of the City's written determination that the Contractor shall be subject to a conflict of interest code. The Contractor shall file a Form 700 (Annual Statement) on or before April 1, disclosing any financial interests held during the previous calendar year for which the Contractor was subject to a conflict of interest code.

If the City requires the Contractor to file a statement of economic interests as a result of the Services and Work performed, the Contractor shall be considered a "City Official" subject to the provisions of the City Ethics Ordinance, including the prohibition against lobbying the City for one year following the expiration or termination of this contract.

The Contractor's personnel employed on the Project shall not accept gratuities or any other favors from any Subcontractors or potential Subcontractors. The Contractor shall not recommend or specify any product, supplier, or contractor with whom the Contractor has a direct or indirect financial or organizational interest or relationship that would violate conflict of interest laws, regulations, or policies.

If the Contractor violates any conflict of interest laws or any of these conflict of interest provisions, the violation shall be grounds for immediate termination of this Contract. Further, the violation subjects the Contractor to liability to the City for all damages sustained as a result of the violation.

ADD: 7-20 PATENTS, TRADEMARKS, AND COPYRIGHTS. The Contractor shall pay, at no additional cost to the City, all applicable royalties and license fees on any and all matters arising in connection with the Work. The Contractor shall defend all suits or claims for infringement of patent, trademark, and copyrights against the City and any other Indemnified Parties, and shall save the City and any other Indemnified Parties harmless from loss on account thereof for any and all matters arising in connection with the Work on the Project, such costs to be paid at no additional cost to the City, except with respect to any particular design process or the product of a particular manufacturer or manufacturers specified and required by the City, other than pursuant to the recommendation or suggestion of the Contractor; provided however, if the Contractor has reason to believe that the design, process or product so specified is an infringement of a patent, the Contractor shall be responsible for any loss resulting unless the Contractor has provided the City with prompt written notice of the Contractor's belief, and the City has nevertheless elected to go forward with such design, process or product so specified.

SECTION 8 - FACILITIES FOR AGENCY PERSONNEL

8-1 General. ADD the following:

8-1.1 Field Office Maintenance. The Contractor shall service, maintain, and clean the field office on a weekly basis to the Engineer's satisfaction. This shall include servicing, cleaning, and maintaining the portable chemical toilet, and replenishing bottled drinking water supplies.

The Contractor shall service and maintain field office equipment. For the air conditioning system, the maintenance shall be performed at intervals recommended by the supplier or manufacturer, or as directed by the Engineer.

The Contractor shall be responsible for maintenance of all items supplied. The Contractor shall repair or replace any equipment or furnishing in the event of damage or theft, at no additional cost to the City.

8-1.2 Field Office Security. The Contractor shall be responsible for field office security. The Contractor shall provide field office security measures necessary for personal protection and prevention of vandalism and theft.

8-1.3 Submittals to Be Provided. The following submittals shall be provided to the Engineer for review and acceptance:

- a) A proposed layout of the interior of the field office, showing wall partitions, doors, and telephone and electrical outlets.
- b) A proposed site plan showing the field office location at the Site.
- c) Location and mailing address of the field office.
- d) Computer workstation literature specifying peripherals and software included.
- e) Manufacturer's information for the FAX machine.

ADD: 8-2.0 General. **If specified in the Special Provisions,** Field office for the City's use shall be required. The field office and contents specified in these specifications shall be retained by the Contractor upon completion of the Project.

8-2.1 Class "A" Field Office. DELETE in its entirety and SUBSTITUTE with the following:

The Contractor shall provide the City with a field office for use by the City field personnel as follows:

- a) The field office shall be a standard office trailer, 10' wide by 60' long, minimum dimensions, with an interior layout providing two fully partitioned offices and a fully partitioned conference room, plus any necessary halls or passageways. The field office shall be located at the Site and shall be designated as the Engineer's Office.
- b) The field office shall be leased for a time period consistent with construction operations, commencing on the date of issuance of the NTP.
- c) The field office shall be completely outfitted and equipped as specified and prepared for occupancy before the start of construction.
- d) The field office shall remain operational during active construction.
- e) The furniture and equipment shall be retained by the Contractor upon completion of the Project.

8-2.1.1 Field Office Features and Equipment. The following features shall be built into the field office:

- a) Windows shall be fitted with screens and blinds or curtains.
- b) An air conditioning and heating system capable of automatically maintaining an office temperature of 72 °F during all seasons.
- c) 8 110V duplex convenience outlets.
- d) 1 exterior door with an exterior light.
- e) A supply of bottled drinking water with a dispenser that provides both hot and cold water. The Contractor shall provide and maintain the supply of bottled drinking water at all times during the construction period.

- f) The Contractor shall provide 1 portable chemical toilet located nearby, but separately from the field office trailer.

8-2.1.2 Furnishings. As a minimum, the field office shall be outfitted with the following furnishings:

- a) 2 Desks (matching).
- b) 2 Matching cushioned swivel chairs with arms.
- c) 3 Plan tables, 8'x2 ½' minimum.
- d) 2 Bookcases, 60" high x 48" wide x 12" deep, 5 adjustable shelves.
- e) 8 Stacking chairs.
- f) 1 4'x6' whiteboard for use by felt tip type markers. Provide 3 markers each in red, green, blue, and black colors, plus 2 erasers.
- g) 2 4-drawer, legal-sized, metal filing cabinets with integral drawer locks.
- h) 2 Wastebaskets (matching).
- i) 1 High Speed Internet Access Line i.e., DSL with paid Internet Service Provider (ISP).
- j) 1 Small refrigerator.
- k) 1 Telephone line with voice messaging, caller ID, and conference call capabilities.
- l) 1 non-coin-operated cordless telephone with a 50' range capability.
- m) 1 Computer desk with two drawers, and sized to fit the computer, monitor, and printer.
- n) 4 Swivel chair for computer workstation.
- o) 1 Computer Workstation complete with all standard peripherals and printer and scanner per the City's IT standards
- p) 1 xerography process copier complete with an automatic feeder, twenty (20) bin sorter and stand. The photocopier shall be a Panasonic Model FP-2230, Sanyo Model 126, or equal. Provide a monthly maintenance policy (service contract). This policy shall include all labor and parts, including travel and consumable supplies such as drums, developer toner and fuser rollers, but excluding paper. The maintenance policy shall be based on 5,000 copies per month. An appropriate storage cabinet/stand shall be provided with the photocopier.

ADD: 8-2.4 Class "D" Field Office. The Contractor shall provide the City a field office for the exclusive use of the City, detached from the Contractor's field office. The City's field office shall consist of a 175 square foot space (minimum) trailer equipped with the following:

- a) A chemical toilet facility adjacent to the field office.
- b) At least one exterior door and window area of not less than 22 ft². Doors and windows shall be provided with screens.
- c) Electric power to include a minimum of four duplex convenience outlets. The office shall be illuminated at the tables and desk. An outdoor lighting fixture with 300W bulb or equal installed to effectively light the area around the field office facility when required by the Engineer.
- d) Furniture and equipment:
 - i. 2 desks and 6 chairs.
 - ii. File cabinet (2-drawer, legal).
 - iii. 1 Bookcase,
 - iv. Computer workstation complete with scanner, monitor, and printer per the City's standard systems. The Computer Workstation shall become the Contractor's property at the completion of Work.

- v. 1 table reference (30"x60").
- vi. 1 Non-coin-operated cordless telephone with a 50' range capability.
- vii. High Speed Internet Access Line i.e., DSL with paid Internet Service Provider (ISP) services for a period consistent with the construction operations.
- viii. A copy machine and supplies.

SECTION 9 – MEASUREMENT AND PAYMENT

ADD: 9-0 TOTAL PRICE.

9-0.1 Price Conditions. **Unless specified otherwise,** the Contract Price is deemed to include all taxes, use, consumer and other taxes mandated by applicable legal requirements.

If specified in the RFP, the Contract Price shall not exceed the stipulated City's estimate of the Project's total cost.

9-0.2 Services Fee. For Design-Build contracts, except as otherwise expressly provided in this contract, as full and complete compensation for performance of all Services and obligations under this contract, the Design-Builder shall be compensated only for the following:

- a) Architectural, engineering and other professional Subcontractors e.g., structural, civil, mechanical, electrical engineers, communications, graphics and art Subcontractors, landscape architects, and acoustical, audio visual, lighting, traffic and security Subcontractors;
- b) Estimating and construction management;
- c) Construction supervision and project management personnel e.g., superintendents, project managers, project secretaries, project engineers, project accountants, and all other the Design-Builder personnel wherever located;
- d) On-site and off-site equipment, supplies and facilities, including but not limited to, computers, estimating, dictating, communication and accounting equipment, office space, trailers and storage facilities;
- e) Home-office and field overhead costs of any type including document control and retention;
- f) The Design-Builder's profit.

ADD: 9-2.2.1 Schedule of Values (SOV). At the pre-construction meeting, the Contractor shall submit for the City's review and approval an SOV for the lump sum Bid items of the Work. The Schedule of Values will:

- a) subdivide the Work into its respective parts,
- b) include values for all items comprising the Work, and
- c) serve as the basis for monthly progress payments.

The City shall be the sole judge of acceptable numbers, details, and description of values established. If, in the opinion of the City, a greater number of SOV items than proposed by the Contractor are necessary, the Contractor shall add the additional items so identified by the City. When requested by City, the Contractor shall provide substantiating data in support of scheduled values.

The Contractor shall incorporate the SOV into the cost loading function of the Schedule in accordance with 6-1, "CONSTRUCTION SCHEDULE AND COMMENCEMENT OF THE WORK." Monthly progress

payment amounts for Lump Sum items shall be determined from the monthly updates of the Schedule activities.

The SOV shall be developed independent but simultaneous with the development of the Schedule activities and logic. The SOV shall incorporate phase funding impacts, if applicable.

The Work not specifically included in the Bid shall be broken down as necessary for establishment of cost and Schedule activity.

Following acceptance of the SOV, the Contractor shall incorporate the changes (if any) into the cost loading portion of the Schedule. Where coordination of the Schedule and the SOV requires changes made to one or both documents, the Contractor shall propose changes to the SOV and to the Schedule activities to satisfy the Schedule cost loading requirements.

For lump sum Design-Build contracts, the Contractor shall provide a cross reference listing which shall be furnished in two parts. The first part shall list each Scheduled activity with the breakdown of the respective valued items making up the total cost of the activity. The second part shall list the valued item with the respective Scheduled activity or activities that make up the total cost indicated. In the case where a number of schedule activities make up the total cost for a valued item (shown in the SOV) the total cost for each scheduled activity shall be indicated. The total amount of each part shall equate to the Contract Price.

These listings shall be updated and submitted in conjunction with the Schedule monthly submittals.

Issued Change or Field Orders reflected in the Schedule shall be incorporated into the SOV as single units identified by the Change or Field Order number.

Changes to the Schedule which add activities not included in the original Schedule but included in the original Work (schedule omissions) shall have values assigned as accepted by the City. Other activity values shall be reduced to provide equal value adjustment increases for added activities as accepted by the City.

In the event that the Contractor and the City agree to make adjustments to the original SOV because of inequities discovered in the original accepted SOV, increases and equal decreases to values for activities may be made.

9-2.2.2 Payment. Payment for the preparation of the SOV shall be included in the various Bid items.

9-3.1 General. ADD the following:

If a separate Bid item has not been provided for an item of the Work described or shown in the Contract Documents, the payment shall be included in the various Bid items.

DELETE the last paragraph in its entirety and SUBSTITUTE with the following:

At the expiration of 35 days from the date of filing NOC and upon receipt by the City Auditor of a fully executed Release of Claims, the amount deducted from the final estimate, and retained by the City, will be paid to the Contractor except such amounts as are required by law to be withheld by properly executed and filed notices to stop payment.

Acceptance by the Contractor of final payments shall be and shall operate as a release to the City of all claims in stated amounts that may be specifically excepted by the Contractor for things done or furnished in connection with this Work and for every act and neglect of the City and others related to or arising out of this Work. Payment by the City will not release the Contractor or his surety from any obligation under Contract or under the performance bond and payment bonds.

The Contractor shall warrant that upon submittal of an application for payment, the Work for which applications for payment have been previously issued and payments received from the City will, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, Claims, security

interests or encumbrances in favor of the Contractor, Subcontractors, Suppliers, or other persons or entities making a Claim by reason of having provided labor, materials, and equipment relating to the Work.

9-3.2 Partial and Final Payment. DELETE the third paragraph in its entirety and SUBSTITUTE with the following:

From each progress estimate, an amount (Retention) not less than 5% of the completed Work will be deducted and retained by the City. The City will withhold not less than 5% of the Contract Price until Acceptance of the Project.

If in the opinion of the Engineer the Work progress is not acceptable, the City may deduct and retain 10% from each progress payment. After 50% of the Work has been completed and if progress on the Work is satisfactory, the total retention held may be limited to 10% of the first half of Contract Price.

ADD the following:

Partial payments made after the Contract completion date will reflect the amount withheld for liquidated damages as required by 6-9, "LIQUIDATED DAMAGES." Any such partial payments made to the Contractor, or its Sureties, will not constitute a waiver of the City's liquidated damages.

Pursuant to California Public Contract Code §22300, the Contractor has the option, at its expense, to substitute for any money withheld by the City, securities equivalent to the amount being withheld. Securities eligible for such substitution are bank or savings and loans certificates of deposit or such securities which are eligible for investment pursuant to Government Code §16430. As to any such security or securities so substituted for monies withheld, the Contractor shall be the beneficial owner of same and shall receive any interest thereon.

Such security shall, at the request and expense of the Contractor, be deposited with the City or with a State or Federally Chartered bank as the escrow agent who shall pay such monies to the Contractor upon notification by the City that payment can be made. Such notification will be given at the expiration of 35 days from the date of acceptance of the work, or as prescribed by law, provided however, that there will be a continued retention of the necessary securities to cover such amounts as are required by law to be withheld by properly executed and filed notices to stop payment, or as may be authorized by the Contract to be further retained.

Neither Final Payment nor any final release of Retention shall become due until the Contractor submits to the City:

- a) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the City or the City's property might be responsible or encumbered, less amounts withheld by the City, have been paid or otherwise satisfied;
- b) a certificate evidencing that insurance required by the Contract Documents to remain in force after Final Payment is currently in effect and will not be canceled or allowed to expire until at least 30-day prior written notice has been given to the City;
- c) consent of Surety to Final Payment; and
- d) if required by the City, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract Documents. If a Subcontractor refuses to furnish a release or waiver required by the City, the Contractor may furnish a bond satisfactory to the City to indemnify the City against such lien,
- e) if required in the Contract Documents, the successful completion and submittal of the required reports such as construction demolition waste recycling and hydrostatic discharge reports, and

- f) the Contractor has completed the Work and has provided record drawings, operations manuals, test reports, warranty documentation, UL labels, and other similar documentation as determined by the City.

ADD: 9-3.2.1 Application for Progress Payment. By the 10th day of each month, the Contractor shall submit to the Engineer a partial payment estimate, filled out and signed by the Contractor, that identifies acceptable Work performed during the previous month, or since the last partial payment estimate was submitted. If requested by the Engineer, the Contractor shall provide such additional data as may be required to support the payment estimate. Such data may include satisfactory evidence of payment for equipment, materials, and labor, including payments to Subcontractors and suppliers.

For application for progress payment, the Contractor shall use the format required by the City. An electronic copy of the invoice form is available from the Engineer upon request.

Progress or partial payments shall not be made until the Contractor submits to the City an updated Schedule that meets the City's requirements. It is solely the responsibility of the Contractor to prepare and submit the Schedule updates.

Thirty days after presentation of undisputed and properly submitted application for payment, the amount will become due and when due will be paid by the City to the Contractor. Any payment request that is disputed or determined to be improper will be returned to the Contractor not later than 7 days after receipt accompanied by documentation describing the reason(s) why the payment request is not proper.

ADD: 9-3.2.2 Amount of Progress Payments. Provided an undisputed and properly submitted application for payment is received by the City, payment shall be made by the City not later than 30th day after the City receives the application for Payment. The City will pay the Contractor for Work performed, including payment for off-site stored materials, through the period covered by the application for Payment, less Retention as set forth in the Contract Documents, provided that the payment amount before Retention will not exceed the percentage of completion of the Work, all as set forth in the SOV.

9-3.2.2.1 Progress Payment for Pipelines. Progress payments for pipelines will be determined by multiplying the total number of linear feet of each of the following operations completed during the payment period, by the corresponding percentage given below, and the unit price Bid for the particular main(s) or drain(s). The progress payment may include payment for items in the Bid proposal, other than mains, which have been installed complete during the payment period.

<u>OPERATION</u>	<u>PERCENTAGE</u>
WATER:	
Trench Excavation, Pipe in Place, Backfill and Cleanup.	80%
Hydrostatic and Bacterial Testing.	
Pavement Restoration and Final Cleanup	20%
SEWER:	
Trench Excavation, Pipe in Place, Backfill and Cleanup.	80%
Testing (Wayneball and/or Mandrel).	
Pavement Restoration and Final Cleanup.	20%
STORM DRAIN:	
Trench Excavation, Pipe in Place, Backfill and Cleanup.	80%
Pavement Restoration and Final Cleanup.	20%
SEWER MAIN REHABILITATION:	

Cleaning, Televising, liner installation, point repairs, and lateral reinstatements	80%
Approval of pipeline rehabilitation verified by Final Video	20%

In asphalt-surfaced streets, 15% payment will be made for hydrostatic and bacterial testing, Wayneball and Mandrelling (where necessary), for water and sewer utility constructions respectively, and operational testing for storm drains, including the concrete trench cap and cleanup. Remaining 5% payment shall be made after completing the asphalt wearing surface and final cleanup.

Trench excavation, pipe in place, backfill, and cleanup of construction debris are to be treated as one operation and shall be complete before the first 80% payment will be made.

ADD: 9-3.2.3 Waiver of Claims at Final Payment. Acceptance of Final Payment by the Contractor shall constitute a waiver of affirmative Claims by the Contractor, except those previously made in writing and identified as unsettled at the time of Final Payment, which are expressly reserved by the Contractor from operation of its Release of Claims pursuant to PCC7100 or other Applicable Law.

ADD: 9-3.2.5 Early Release of Subcontractor Retention. If a Subcontractor has completed its portion of the Work, including all Punch List items, pursuant to any given Subcontract, the Contractor may request the City to disburse the Retention allocable to such Subcontractor, after delivering to the City acceptable releases from the Subcontractor and consent to such disbursement from such the Contractor's Surety, in a form reasonably satisfactory to the City. The City, at its sole discretion, may determine that the Subcontractor's Work has been completed in accordance with the Contract Documents, and may disburse the Subcontractor's share of Retention to the Contractor for distribution to the Subcontractor.

ADD: 9-3.2.6 Withholding of Payment. The City may withhold payment on account of an application for payment to the extent necessary to protect the City from loss because of:

- a) Defective or incomplete Work not remedied;
- b) A deductive Change Order;
- c) Third Party Claims filed or reasonable evidence indicating probable filing of such Claims;
- d) Failure of the Contractor to make payments of undisputed amounts to Subcontractors for labor, materials, or equipment;
- e) Damage to the City or a Separate Contractor caused by the fault or neglect of the Contractor to the extent not covered by insurance;
- f) Reasonable evidence that the Work will not be completed within the Contract Time due to Inexcusable Delay, and that the unpaid balance of the Contract Price would not be adequate to cover Liquidated Damages for the anticipated or actual Unexcused Delay;
- g) Persistent failure of the Contractor to perform the Work in accordance with the Contract Documents, including failure to maintain the progress of the Work in accordance with the Schedule. Persistent failure to maintain the progress of the Work shall mean that for a period of two consecutive months following a written notice from the Engineer, the Contractor fails to correct a behind-schedule condition at a rate that would reasonably indicate that he will finish the Project on schedule;
- h) Disregard of authority of the Engineer or the laws of any public body having jurisdiction; or
- i) Stop notices, wage orders, or other withholdings required by Applicable Law.

When all the above reasons for withholding payment are removed, payment shall be made for amounts previously withheld. Prior to any withholding pursuant to this section, the City will meet with the Contractor to discuss potential withholding, and attempt in good faith to resolve such issue without the need for withholding.

ADD: 9-3.3.1 Payment for Stored Materials. The Contractor may request payment for products (i.e., material, equipment, or both) which will be incorporated into the Work (excluding living or perishable plant materials) and are delivered to the Project or stored per manufacturer's recommendation in or near the Site.

Consideration will only be given to materials for major items of the Work or Materials Subject to Price Adjustment (when Price Adjustment is included in the Contract Documents) provided each such individual item has a value of more than 1% of the Contract Price and will become a permanent part of the work. Materials cost shall be evidenced by manufacturer's paid invoice bearing the statement that all previous invoices have been paid.

The Contractor shall provide the City, upon request and prior to any partial payment, documentation which transfers absolute legal title to such materials to the City conditional only upon receipt of Final Payment. Neither such transfer of title nor any partial payment shall constitute acceptance by the City of the materials, nor void the right to reject materials subsequently found to be unsatisfactory in accordance with 4-1, "MATERIALS AND WORKMANSHIP" or in any way relieve the Contractor of any obligation arising under the Contract Documents.

Partial payments may be made to the extent of the delivered cost of approved materials delivered or stored. The Contractor shall make application for payment for materials on hand or stored on a form provided by the City to:

- a) show the amount originally paid on the invoice (or other record of production cost) for the items on hand,
- b) the dollar amount of the material incorporated into each of the various work items for the month, and
- c) the amount that should be retained in material on hand items.

The application for payment shall be accompanied by a bill of sale, paid invoice, or other documentation warranting that the Contractor has received the materials and equipment free and clear of all liens, charges, secured interests, and encumbrances and evidence that the materials and equipment are covered by appropriate property insurance in accordance with the insurance provisions and other arrangements to protect the City's interest.

The Contractor shall assume all risks associated with the loss or damage to the stored products for which payment has been received or not.

The payments for materials on hand shall not exceed the invoice price or 60% of the bid prices for the pay items into which the materials are to be incorporated, whichever is less, unless otherwise approved by the Engineer, and shall be subject to retention as set forth in 9-3.2, "Partial and Final Payment." Any and all surplus materials that are not incorporated in Work will become the property of the Contractor at no additional cost to the City.

Unless specifically provided in the contract, payment for materials on hand is not included when determining the percentage of Work completed.

The material shall meet Contract requirements. The required test results and/or certifications shall be on file with the Engineer.

Equipment and material shall be stored in accordance with manufacturer's recommendations. The stored products shall be in a form ready for installation. The City will not pay for raw materials or parts and pieces of equipment.

ADD: 9-3.3.2 Payment for Stored Materials off Site. Payment for materials stored off-site shall be subject to the provisions in 9-3.3.1, "Payment for Stored Materials" and the following:

The City reserves the right to refuse approval for payment for any equipment or materials suitably stored off-site in its sole discretion, regardless of whether all conditions herein have been met.

Partial payment may be made for products eligible for off-site delivery and storage only upon presentation by the Contractor of a bill of sale, a paid invoice or an affidavit certifying that the material is received by the Contractor free and clear of all liens, encumbrances and secured interests of any kind, and including, for off-site delivery.

Partial payment for products delivered and stored off-site shall be contingent upon the Contractor's compliance with the storage and protective maintenance requirements set forth in the Contract Documents and all other requirements necessary to preserve equipment warranties for the benefit of the City.

Costs associated with delivery to and storage at an off-site facility shall be assumed by the Contractor regardless of the City's approval to deliver and store the materials.

The Contractor shall provide written evidence to the City of having made arrangements for unrestricted access by the City and its authorized representatives to the materials wherever stored, including provision for the City to take control and possession of such materials at any time and without restriction. The Contractor shall furnish the City a permit of entry, from the owner of the property, for at least 6 months after the NOC has been filed. The permit of entry shall contain information similar to the following:

"PERMIT OF ENTRY: Permission is hereby granted to the City and its designated employees or agents to enter upon the property described herein for a period of not less than 6 months after the NOC has been filed for (Project Name) for the purpose of removing materials for which advance materials on hand payment has been made to (Contractor's Name). The property is owned by (Owner's Name) and is described as follows: (Address and Description of Property). (Include signature(s) and date(s) for owner and lessee or purchaser, and, if appropriate, attach a copy of a warehouse receipt or contract for storage.)"

The material shall be clearly marked and identified as being specifically fabricated, produced, and reserved for use on the Project.

9-3.4 Mobilization: ADD the following:

Mobilization shall consist of labor and operations, including those necessary for the movement of personnel, equipment, supplies, and incidentals to and from the Site; for establishment of all offices, buildings, storage yards, and other facilities necessary for Work, and for all other work and operations which shall be performed prior to beginning Work and after completion of Work on the various Contract items on the Site.

The Contractor shall properly design the Project parameters to incorporate construction mobility for moving on and off the Site in a manner that limits disturbance to the surrounding residences, businesses, and any other citizens. This includes the designated staging areas, loading areas, and assemblage areas. The Contractor shall consider and address access rights of the public at all times. The Contractor shall be required to prepare a "Mobilization Plan" that will describe and govern the Contractor's mobilization activities.

The complete dismantling and removal by the Contractor of all of the Contractor's properties, temporary facilities, equipment, materials, construction wastes, and personnel at the Site referred to as demobilization shall be included in mobilization.

9-3.4.1 Payment. When a separate Bid item has been provided for mobilization, payment for mobilization will be distributed equally over the first 2 progress payments up to the bid amount, but not to exceed 3% of the Contract Price. If the Bid item for mobilization exceeds 3% of the Contract Price, any such differential amount up to the bid amount, shall be paid as a part of the Final Payment.

If a separate Bid item has not been provided for mobilization, the payment for mobilization shall be included in the various Bid items.

ADD: 9-3.5 Field Orders. A Field Order is a written order by the Engineer to compensate the Contractor for items of work in accordance with 3-3, "Extra Work," or 3-4, "CHANGED CONDITIONS." A Field Order does not change the Contract Price or Contract Time or the intent of the Contract.

Field Order items of work may be paid for in accordance with this section provided that the cumulative total of Field Orders does not exceed the Field Order Bid Item. 100% of unused portions of the Field Orders shall revert to the City after acceptance of the Project.

Table 9-3.5(A) Field Order Limits

Construction Contract Price	Max. Amount for Each Field Order
Less than \$100,001	\$2,500
\$100,001 to \$1,000,000	\$5,000
\$1,000,001 to \$5,000,000	\$10,000
Greater than \$5,000,000	\$20,000

ADD: 9-3.6 Phased Funding Compensation. For the Phased Funding contracts, ADD the following:

9-3.6.1 Compensation under Each Phase. Total compensation to be paid to the Contractor by the City for all Work performed under each phase of this contract shall not exceed the amount specified for each phase in the final Phased Funding Schedule Agreement unless specified otherwise by Change Order.

9-3.6.2 Work to Be Performed Under Each Phase. The Work to be performed under this contract as part of the first phase is identified in the approved Pre-Award Schedule. The Work elements to be completed as part of each phase shall be functional and complete for the intended purpose in the event the subsequent phases are not authorized by the City. Subsequent phases shall be authorized by the City in advance of construction of work identified in such phases.

9-3.6.3 Work and Compensation for Funding Phases. The subsequent phases to the first phase are subject to funding availability by the City. The City's and the Contractor's obligations under this contract are as follows:

- a) Funds availability for performance of Work is described in the first Phased Funding Schedule Agreement and subsequently the final Phased Funding Schedule Agreement. The amount of funds available at award shall be sufficient for the performance of first phase only. When additional funds are available for the full requirements of the next funding phase, the City will notify the Contractor. The City may modify the amount of funds as available for Contract performance in the final Phase Funding Schedule via Change Order. This procedure shall apply for each successive funding phase.
- b) The City is not obligated to the Contractor for any amount over that specified in the first Phased Funding Schedule Agreement or final Phased Funding Schedule Agreement as available for Contract performance and authorized by the City Council.
- c) The Contractor is not obligated to incur costs for the performance of Work for any funding phase after the first funding phase; unless and until written notification is received from the City of an increase in the availability of funds. If so notified, the Contractor's obligation shall

increase only to the extent the Contract performance is required for the additional funding phase for which funds are made available.

- d) If the Contract is terminated in accordance with 6-5, "Termination of the Contract" the settlement proposal shall be determined pursuant to procedures established in 6-5, "Termination of the Contract" for work under specific funding phases for which funds have been made available. If the Contract is terminated for default, the City's rights under this contract shall apply to the entire multi-phase requirements.
- e) Notification to the Contractor of an increase or decrease in the funds available for performance of this contract under another clause (e.g., an "option" or "changes" clause), shall not constitute the notification contemplated in Subparagraph "a" above.

ADD: 9-3.7 Compensation Adjustments for Price Index Fluctuations. The provisions of this section shall apply only to the paving asphalt used in:

- a) Rubberized Asphalt Concrete (RAC) Overlay,
- b) Asphalt Pavement Repair (2" Mill & Pave), and
- c) Scheduled and Unscheduled Base Repair w/RAC, and RPME (REAS).

The compensation payable for paving asphalt used in hot mix asphalt will be increased or decreased in conformance with the provisions of this section for paving asphalt price fluctuations exceeding 5% (Iu/Ib is greater than 1.05 or less than 0.95) which occur during performance of the Work.

The quantity of paving asphalt used in REAS will be determined by multiplying the item quantity for REAS included in a monthly estimate by the minimum percent residue specified in 600-3.2.4, "Quality Requirements."

At the Contractor's option, the Contractor may provide actual daily test results for paving asphalt residue for the REAS used. Test results provided by the Contractor shall be from an independent testing laboratory that participates in the AASHTO Proficiency Sample Program. The Contractor shall take samples of REAS from the distributor truck at mid-load from a sampling tap or thief. Two separate 2-liter samples shall be taken in the presence of the Engineer. The Contractor shall provide one sample to the Contractor's independent testing laboratory within 24 hours of sampling. The second sample shall be given to the Engineer. The test results from the Contractor's independent testing laboratory shall be delivered to the Engineer within 10 days from sample date. Delete Paras 3 and 4 if no contract item for tack coat.35. Delete "or tack coat or both" if no contract item for tack coat.

The adjustment in compensation will be determined in conformance with the following formulae when the hot mix asphalt or tack coat or both are included in a monthly estimate:

Total monthly adjustment = AQ

- a) For an increase in paving asphalt price index exceeding 5%:
 $A = 0.90 (Iu/Ib - 1.05) Ib$
- b) For a decrease in paving asphalt price index exceeding 5%:
 $A = 0.90 (Iu/Ib - 0.95) Ib$

Where:

A = Adjustment in dollars per ton of paving asphalt used to produce hot mix asphalt and asphaltic emulsion residue used as tack coat rounded to the nearest \$0.01.

Iu = The California Statewide Paving Asphalt Price Index which is in effect on the first business day of the month within the pay period in which the quantity subject to adjustment was included in the estimate.

Ib = The California Statewide Paving Asphalt Price Index for the month in which the bid opening for the project occurred.

Delete "plus the quantity in tons of asphalt binder that would have been used as residue in the tack coat shown under 'This Estimate' on the monthly estimate" if no contract item for tack coat.

Q = Quantity in tons of asphalt binder that was used in producing the quantity of hot mix asphalt shown under "This Estimate" on the monthly estimate using the amount of asphalt binder determined by the Engineer plus the quantity in tons of asphalt binder that would have been used as residue in the tack coat shown under "This Estimate" on the monthly estimate.⁶

The adjustment in compensation will also be subject to the following:

- a) The compensation adjustments provided herein will be shown separately on payment estimates. The Contractor shall be liable to the City for decreased compensation adjustments and the City may deduct the amount thereof from moneys due or that may become due the Contractor.
- b) Compensation adjustments made under this section will be taken into account in making adjustments in conformance with the provisions in Section 3-2.2, "Contract Unit Prices," of the Standard Specifications.
- c) In the event of an overrun of contract time, adjustment in compensation for asphalt binder included in estimates during the overrun period will be determined using the California Statewide Paving Asphalt Price Index in effect on the first business day of the month within the pay period in which the overrun began.

The California Statewide Paving Asphalt Price Index is determined each month on the first business day of the month by the Department using the median of posted prices in effect as posted by Chevron, ExxonMobil, and Union 76 for the Buena Vista, Huntington Beach, and Midway Sunset fields.

In the event that the companies discontinue posting their prices for a field, the Department will determine an index from the remaining posted prices. The Department reserves the right to include in the index determination the posted prices of additional fields.

The California Statewide Paving Asphalt Price Index is available on the Division of Engineering Services website at: http://www.dot.ca.gov/hq/esc/oe/asphalt_index/astable.html

ADD: 9-4 ALLOWNCE. Payment under "AL" Allowance Bid items will be based on the actual expenditures for pre-authorized items of Work in accordance with Contract Documents. 100% of unused portions of the Allowances shall revert to the City upon Acceptance.

ADD: 9-5 WAIVER OF CLAIMS. The acceptance by the Contractor of the Final Payment of undisputed Contract amounts shall release the City, the Engineer, and the Design Consultant as agent of the City, from all claims and all liability to the Contractor for all things done or furnished in connection with the Work, and every act of the City and others relating to or arising out of the Work and related to those undisputed amounts. No payment, however, final or otherwise, shall operate to release the Contractor and the Surety from obligations under this contract and the Performance Bond, Payment Bond, and other bonds and warranties as herein provided.

PART 2

CONSTRUCTION OF MATERIALS

SECTION 200 – ROCK MATERIALS

200-1.4 Coarse Aggregate for Portland Cement Concrete. Table 200-1.4(B), ADD the following note:

For ASTM C131 Test Grading C the Alternate California Test 211 may be used.

ADD: 200-1.5.6 Sand For Play Areas. Sand for play areas shall be imported, double washed, manufactured silica sand #20, #30, or “Pro-Tour” as manufactured by Oglebay Norton Industrial Sands, Inc. or approved equal, free of deleterious organic material, loam, clay and debris, with a “mean effective size” between 0.30 inches minimum and 0.65 inches maximum and a “mean uniformity coefficient” between 1.00 and 2.5. The Contractor shall submit certification of the above requirements to the Engineer at time of product submittals in accordance with 2-5.3, “Submittals.” Sand shall only be installed with filter fabric and drain system. Depth of installed sand shall be 12 inches minimum to attenuate falls per ASTM F1292.

200-1.6 Stone for Riprap. ADD the following:

The individual classes of rocks used in slope protection shall conform to Table 200-1.6(A).

Replace Table 200-1.6(A) with:

Table 200-1.6(A)
PERCENTAGE LARGER THAN

Rock Sizes	CLASSES					
	2 Ton (1.8 Tonne)	1 Ton (900 kg)	½ Ton (450 kg)	1/4 Ton (220 kg)	No. 2 Backing	No. 3 Backing
4 Ton (3.6 Tonne)	0-5					
2 Ton (1.8 Tonne)	50-100	0-5				
1 Ton (900 kg.)	95-100	50-100	0-5			
½ Ton (450 kg.)		-----	50-100	0-5		
1/4 Ton (220 kg.)		95-100	-----	50-100		
200 Lb. (90 kg.)			95-100	-----		
75 Lb. (34 kg.)				95-100	0-5	
25 Lb. (11 kg.)					25-75	0-5
5 Lb. (2.2 kg.)					90-100	25-75
1 Lb. (0.4 kg.)						90-100

The amount of material smaller than the smallest size listed in the table for any class of rock slope protection shall not exceed the percentage limit listed in the table determined on a weight basis. Compliance with the percentage limit shown in the table for all other sizes of the individual pieces of any class of rock slope protection shall be determined by the ratio of the number of individual pieces larger than the smallest size listed in the table for that class also pertaining to 200-1.7, “Selection of Riprap and Filter Blanket Material.”

ADD: 200-1.7 Selection of Riprap and Filter Blanket Material:

Table 200-1.7(A)

Velocity Ft/Sec (Meters/Sec) (1)	Rock Class (2)	Rip Rap Thick- Ness "T"	Filter Blanket Upper Layer(s) (3)			
			Option 1 Sect. 200 (4)	Option 2 Sect.400 (4)	Option 3 (5)	Lower Layer (6)
6-7 (2)	No. 3 Backing	0.6	3/16" (5 mm)	C2	D.G.	----
7-8 (2.2)	No. 2 Backing	1.0	1/4" (6 mm)	B3	D.G.	----
8-9.5 (2.6)	Facing	1.4	3/8" (9.5 mm)	----	D.G.	----
9.5-11 (3)	Light	2.0	½" (12.5 mm)	----	3/4"- 1-1/2" (25mm) P.B.	----
11-13 (3.5)	220 kg (1/4 Ton)	2.7	3/4" (19 mm)	----	3/4"- 1-1/2" (25mm) P.B.	SAND
13-15 (4)	450 kg (½ Ton)	3.4	1" (25 mm)	----	3/4"- 1-1/2" (25mm) P.B.	SAND
15-17 (4.5)	900 kg (1 Ton)	4.3	1-1/2" (37.5 mm)	----	TYPE B	SAND
17-20 (5.5)	1.8Tonne (2 Ton)	5.4	2" (50 mm)	----	TYPE B	SAND

See Section 200-1.6, "Stone for Riprap" and Table 200-1.6 (A).

Practical use of this table is limited to situations where "T" is less than inside diameter.

- (1) Average velocity in pipe or bottom velocity in energy dissipater, whichever is greater.
- (2) If desired rip rap and filter blanket class is not available, use next larger class.
- (3) Filter blanket thickness = 1' (0.3 Meter) or "T", whichever is less.
- (4) Standard Specifications for Public Works Construction.
- (5) D.G. = Decomposed Granite, 1mm to 10mm.

P.B. = Processed Miscellaneous Base.

Type B = Type B bedding material, (minimum 75% crushed particles, 100% passing 62.5 mm (2 ½") sieve, 10% passing 1" sieve).

- (6) Sand 75% retained on #200 sieve.

200-2.1 General. First paragraph, DELETE in its entirety and SUBSTITUTE with the following:

Materials for use as base or subbase shall be classified in the order of preference as follows:

- a) Crushed Aggregate Base
- b) Crushed Slag Base
- c) Crushed Miscellaneous Base
- d) Processed Miscellaneous Base
- e) Class 2 Aggregate Base
- f) Disintegrated Granite Base
- g) Select Subbase

ADD: 200-2.9 Class 2 Aggregate Base.

200-2.9.1 General. Class 2 Aggregate Base shall consist of broken or crushed asphalt, concrete, Portland cement concrete, railroad ballast, crushed porcelain material, crushed rock, rock dust, brick, or natural material. The material shall be free from organic matter and other deleterious substances, and shall be of such nature that it can be compacted readily under watering and rolling to form a firm, stable base.

200-2.9.2 Grading. The coarse aggregate (material retained on the 4.75 mm (No. 4) sieve) shall consist of material of which a minimum of 25% by weight shall be crushed particles as determined by California Test 205.

Aggregate shall conform to the grading requirements shown in Table 200-2.9.2(A). At the option of the Contractor, the grading for either the 1.5" (37.5 mm) maximum or ¾" (18.75 mm) maximum shall be used, except that once a grading is selected it shall not be changed without the Engineer's written approval.

TABLE 200-2.9.2(A) Percentage Passing

Sieve Size	1-1/2" (37.5 mm) Maximum Individual Test Results	3/4" (18.75 mm) Maximum Individual Test Results
2" (50 mm)	100	-----
1-1/2" (37.5 mm)	87-100	-----
1" (25 mm)	-----	100
¾" (19 mm)	45-90	87-100
No. 4 (4.75 mm)	20-50	30-60
No. 30 (600 µm)	6-29	5-35
No. 200 (75 µm)	0-12	0-12

200-2.9.3 Quality Requirements. Class 2 aggregate base shall conform to the following requirements:

TABLE 200-2.9.3(A)

Tests	California Test	Individual Test
Resistance (R-value)	Calif. 301	78 Min.
Sand Equivalent	Calif. 217	30 Min.
Durability Index		35 Min.

200-2.10 Infield Mix.

200-2.10.1 General. Infield mix shall be designated for use in sports infield areas. Infield mix shall be free from organic matter and other deleterious substances and shall be of such nature that it can be compacted readily under water and rolling to form a firm, stable base.

200-2.10.2 Grading. Infield mix shall meet the following requirements:

<u>Sieve Size</u>	<u>% Passing Sieve</u>
4.75 mm (No. 4)	100
2.36 mm (No. 8)	90 - 100
1.18 mm (No. 16)	85 - 95
600 µm (No. 30)	65 - 85
300 µm (No. 50)	35 - 55
150 µm (No. 100)	20 - 35
75 µm (No. 200)	10 - 25

Sand Equivalent	15 - 25
pH (7.2 Neutral)	6 - 8.5
Percent Clay	10 – 15

ADD: 200-3 CEMENT TREATED BASE.

200-3.1 General. Cement treated base shall consist of broken or crushed asphalt, portland cement concrete, railroad ballast, crushed porcelain material, crushed rock, rock dust, or natural material, and a minimum of 2% Portland Cement by weight of dry aggregate. Aggregate shall not exceed 120 °F at time of mixing. Water added shall be at or near optimum as determined by ASTM D 1557, method C. Materials used for cement treated base shall meet requirements of 200-1, "ROCK PRODUCTS" except as modified herein.

200-3.2 Grading. Material shall be uniformly graded and shall conform to the following gradation:

<u>Sieve Size</u>	<u>% Passing Sieve</u>
1" (25 mm) sieve	90 -100
3/8" (9.5 mm) sieve	65 - 85
No. 4 (4.75 mm) sieve	45 - 65
No. 30 (600 µm) sieve	15 - 35
No. 200 (75 µm) sieve	3 – 15

Sand Equivalent	30 minimum
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Blending of rock dust and mineral fillers necessary to meet grading requirements will be permitted only in central-plant mixing.

200-3.3 Quality Requirements. Not more than 3% of material retained on the NO.4 sieve shall soften and disintegrate when soaked in water for a period of 30 minutes.

SECTION 201 – CONCRETE, MORTAR, AND RELATED MATERIALS

201-1.1.1 General. ADD the following:

Colored sidewalk improvements shall be done **as specified in the Special Provisions** (e.g., Sombrero Buff, Cardinal Solomon, Davis Brick Red, and French Grey) or as directed by the Engineer.

201-1.1.2 Concrete Specified by Class and Alternate Class. MODIFY Table 201-1.1.2(A) as follows:

CHANGE concrete class for "Concrete Pavement (not integral with curb)" from "520-A-2500" to "560-B-3250." Monolithic curb and pavement shall not be allowed.

CHANGE concrete class for "Sidehill Surface Drainage Facilities" from "500-C-2500" to "520-C-2500".

CHANGE concrete class for "Fence and Guardrail Post Foundations" from "500-C-2500" to "520-C-2500".

201-1.2.1 Portland Cement. First paragraph, first sentence REVISE to read as follows:

Cement to be used or furnished shall be low alkali and shall be either Type I or Type II Portland Cement conforming to ASTM C 150, or Type IP (MS) portland - pozzolan cement conforming to ASTM C595, **unless otherwise specified.**

201-1.2.3 Water. Second paragraph REPLACE "1,000 PPM (mg/L) of sulfates" with "1,300 (mg/L) PPM of sulfates".

Third paragraph REPLACE "800 PPM (mg/L) of sulfates" with "1,300 (mg/L) PPM of sulfates."

201-1.4.3 Transit Mixers. Add the following:

Time and date of batching shall be machine stamped.

ADD: 201-8 MANHOLES (MHs).

201-8.1 Pre-fabricated Manhole Bases. Prefabricated Manhole Base (PMB) shall not be allowed **unless otherwise shown on the Plans.** When the PMB is shown on the Plans and if the MH is modified or placed at a new location because of a design change either in the vertical or horizontal position and the PMB does not meet the design criteria, the Contractor shall order a new PMB that complies with the modified alignment, location, or both. The City will compensate the Contractor for the base, restocking costs, and other related costs.

PMB may be allowed, when not shown on the Plans, if the Contractor assumes all the risk and additional costs of the MH relocation as a result of unforeseen conditions or design changes. If the MH is modified or placed at a new location because of a design change either in the vertical or horizontal position and the PMB does not meet the design criteria, the Contractor shall order a new PMB that complies with the modified alignment and location. Otherwise, the Contractor shall replace the PMB with a cast in place base at no additional cost to the City.

If the PMB channels do not have the proper slopes or configuration as shown on the Plans or if the installation is not in compliance with the Contract requirements or the manufacturer's recommendations, the PMB will be rejected by the Engineer and the Contractor shall cast a new base in place at no additional cost to the City.

201-8.2 Polymer Mortar. The following products are acceptable for use in manhole riser joints:

<u>Material</u>	<u>Manufacturer</u>
490 Epoxy Putty	Engard Coatings, Huntington Beach, CA
Sikadur 31 Hi-Mod Gel	Sika Corporation, Santa Fe Springs, CA
Sikadur 32 Hi-Mod Gel	Sika Corporation, Santa Fe Springs, CA
CS-102 Butyl Gaskets (rope form)	Concrete Sealants, New Carlisle, OH

201-8.3 Polyurethane Coating. The epoxy primer and polyurethane liner shall be manufactured by the following, or equal:

- a) Zebron
- b) Sancon

The color shall be white or beige. The Contractor shall submit complete manufacturer specifications, application procedure and references for review and approval.

201-8.4 Exterior Waterproofing for Manholes. The coal tar emulsion shall be Kopper-Bitumastic Super Service Black, or approved equal. Application of this material shall be in accordance with the manufacturer's instructions and these specifications.

SECTION 203 – BITUMINOUS MATERIALS

203-1.6 Measurement and Payment. ADD the following:

Unless otherwise provided for in the Bid as separate Bid item, the payment for paving asphalt shall be included in the item of Work to which its use is incidental.

203-2.6 Measurement and Payment. ADD the following:

Unless otherwise stated in the Bid, the payment for liquid asphalt shall be included in the item of Work to which its use is incidental.

203-3.6 Measurement and Payment. ADD the following:

Unless otherwise stated in the Bid, the payment for emulsified asphalt shall be included in the item of Work to which its use is incidental.

203-5.4 Mix Design. Second Paragraph, second Sentence, DELETE "2 days" and SUBSTITUTE "4 Working Days."

ADD the following:

The completed slurry shall have a minimum skid resistance of 40 when tested per the Caltrans's California Test 342.

203-6.1 General. First paragraph, last sentence, DELETE in its entirety and SUBSTITUTE with the following:

The content of paving asphalt recovered from the RAP shall be determined in conformance with California Test 382 each day RAP is used or as approved by the Engineer.

SECTION 205 - PILES

205-3.1 General. Last paragraph after ASTM C 31, ADD: "and ASTM C 39."

SECTION 206 – MISCELLANEOUS METAL ITEMS

ADD: 206-7 STREET NAME SIGN. Street name signs shall conform to the requirements of the Standard Drawing SDM-102, "Street Name Sign".

SECTION 207 – PIPE

207-9.2.3 Fittings. ADD the following:

Fittings shall be mechanical joints and shall be in accordance with AWWA C153 and AWWA C111. Bolt holes in the flanges of the mechanical joint fitting shall straddle the vertical centerline of the fitting.

Glands shall be made of ductile iron and shall be factory-stamped. The ductile iron used for the production of glands shall have a minimum elongation of 5%. Bolts shall be tee heads made of high-strength low-alloy steel or ductile iron in accordance with AWWA C111.

The pipe for threaded flange ductile-iron extension spools for above ground and vault shall be Class 53 minimum and cut to allow for ½" additional length for Flange x Flange and 0.25" additional length for Flange x Pipe End.

Machine tapered pipe thread (NPT) shall comply with ANSI B1.20.1 adapted to ductile-iron pipe outside diameters.

The threaded flange shall be dimensioned in accordance with USA Standard Taper Pipe and shall be attached to the machined pipe threads. The threaded flange shall be removed from the pipe and

two-part epoxy thread sealant shall be applied to the pipe threads and the flange threads. Coal tar coating shall comply with AWWA C203 and epoxy coating shall comply with AWWA C213. The threaded flange shall be re-attached to the pipe threads and shall be machine tightened. Facing and flange alignment for the threaded joints shall comply with AWWA C115.

The threaded joint and spool assembly shall be hydrostatically tested 300 psi, stamped with the manufacturer's mark indicating length, weight, and customer, and stenciled with "Tested at 300 PSI".

Certification of Compliance with all specifications shall be furnished.

207-9.2.4 Lining and Coating. DELETE in its entirety and SUBSTITUTE with the following:

Unless otherwise specified, the internal surfaces of iron pipe and fittings shall be lined with a uniform thickness of cement mortar then sealed with a bituminous coating in accordance with AWWA C104.

The outside surfaces of ductile iron pipe and fittings, including valves and appurtenances for buried service shall be coated with one of the following:

- a) 24 mils minimum dry film thickness (MDFT) liquid epoxy coating in accordance with AWWA C210. Coal tar epoxies shall not be used.
- b) 24 mils MDFT Fusion Bonded Epoxy coating in accordance with AWWA C213 and AWWA C116.
- c) A cold applied three-part system, 80 mils petroleum Wax Tape coating in accordance with AWWA C217
- d) 24 mils MDFT 100% solids Polyurethane coating in accordance with AWWA C222.

Prior to coating, the iron surfaces shall be blast cleaned in accordance with the applicable National Association of Pipe Fabricators (NAPF) standard 500-03, "surface preparation standard for ductile iron pipe and fittings receiving special external coatings and/or special internal linings." The entire coated surface shall be inspected with a holiday detector in accordance with National Association of Corrosion Engineers (NACE International) standard SP0188-2006, "Discontinuity (Holiday) testing of new protective coatings on conductive substrates."

The fitting shall be lined with cement mortar and tar (seal) in accordance with AWWA C104/A21.4. The interior of bells shall be lined **as specified in the Special Provisions**. The Contractor shall provide double thickness lining and shall use cement conforming to ASTM C150 Type II. Coating on Interior bells shall be holiday free. The outside shall be asphalt-coated per AWWA C151. The fitting, when assembled, shall be polyethylene-encased in accordance with the requirements of AWWA C105.

Fittings for sewer force mains shall be lined and coated with fusion bonded epoxy **as specified in the Special Provisions**. Lining and coating shall be holiday free on all surfaces of the fittings, including bells.

207-9.2.6 Polyethylene Encasement for External Corrosion Protection. ADD the following:

The outside surfaces of ductile iron pipe and fittings for general use shall be coated with a bituminous coating 1 mil (25 µm) thick in accordance with AWWA C151 or AWWA C110.

ADD: 207-10.4.7 Cement Mortar Lining and Polyolefin Tape Coating. Cement-mortar lining shall comply with the requirements of 207-10.4.2, "Cement-Mortar Lining and Coating."

External steel pipe surfaces shall be coated with a 3-part factory applied tape coating system in accordance with AWWA C214. Additional mechanical protection shall be provided by the application of a 1-inch thick reinforced cement-mortar armor coating applied in accordance with AWWA C205.

207-17.1 General. DELETE in its entirety and SUBSTITUTE with the following:

This subsection applies to the requirement for unplasticized polyvinyl chloride (PVC) plastic pipe for gravity flow sewers and house connection sewers. Pipe, fittings, couplings and joints shall be in conformance with the requirements of ASTM D-3033, D-3034 or F-679, except as modified herein. The ASTM Designation, SDR, pipe stiffness and type of joint shall be specified on the plans and/or specifications. When PVC sewer pipe is specified without further qualifications the pipe shall conform to the following requirements:

- a) 4" thru 15" size pipe ASTM D-3034, SDR 35
- b) 18" thru 27" size pipe ASTM F-679
- c) Shall conform to SDS-101 and,
- d) Shall have gasketed joints.

207-17.3.1 General. ADD the following:

The joint approved for PVC pipe on this project is Elastomeric Gasket in accordance with 207-17.3.2, "Elastomeric Gasket Joints." The gasket shall be polyurethane or synthetic rubber with equal or greater resistance to solvency, chemical, or biological attack.

207-18.1 General. Add the following:

The location of HDPE pipe shall be as shown on the Plans. Pipe sizes larger than 36" shall not be allowed on this contract.

The use of HDPE pipe shall be in compliance with the Caltrans Standard Specifications, Sections 61 and 64, these specifications and the applicable ASTM and AASHTO standards. In the case of a discrepancy, the more restrictive requirements shall govern.

207-18.4.1 Water-Tight Joints. Add the following:

Pipe shall be water-tight under pressure and all conditions of expansion, contraction and settlement. Joints and plastic pipe culvert shall conform to either standard or positive joint provisions in Caltrans Standard Specifications Section 61-1.02, "Performance Requirements for Culvert and Drainage Pipe Joints," except that where sleeve joint connections are utilized, the sleeve minimum width shall be 7.75" inches, and at least 2 corrugations from each pipe to be joined are engaged by the sleeve.

Where water-tight joints are not specified, Type S corrugated polyethylene pipe shall incorporate, on each side of the joint, a closed-cell expanded rubber gasket conforming to the requirements in ASTM D1056, Grade 2A2.

207-18.5.8 Cell Classification. REVISE to read:

Cell classification of pipe and fittings shall conform to 207-18.2.1, "Extruded Pipe and Fittings and Blow Molded Fittings" and ASTM D 3350.

ADD: 207-18.5.9 Unit Weight. The pipe unit weight shall be computed as the average weight per foot of length determined from 3 test specimens, taken from each manufactured run. Each test specimen for pipes 24" in diameter and less shall be a minimum length of 2 diameters. The length of each test specimen for pipes larger than 24" in diameter shall be one diameter or a maximum of 36", whichever is less. The weight of pipe specimens shall be determined with any suitable weighing device accurate to 0.10 pound. The pipe unit weight for each individual kind and size of plastic pipe shall equal or exceed the minimum unit weight value for each individual kind and size of plastic pipe listed in Table 207-18.5.9(A).

Table 207-18.5.9(A)

Nominal Diameter (inches)	Type S (Pounds per linear foot)
12	2.7
15	4.0
18	6.0
24	10.2
30	15.0
36	18.1

ADD: 207-18.8 References. The Contractor shall refer to the latest editions of the reference specifications in Caltrans Standard Specifications, these specifications, AASHTOM294 (Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm Diameter), and the following:

- a) ASTM D2321: Recommendations For The Installation of Buried Thermoplastic Pipe
- b) ASTM D2584: Test Method for Ignition Loss of Cured Reinforced Resins
- c) ASTM D3839: Standard Guide for Underground Installation of Fiberglass (Glass-Fiber Reinforced Thermosetting-Resin) Pipe
- d) ASTM D1056: Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
- e) ASTM D 3350: Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

207-19.1 General. ADD the following:

PE pipe used in pipe bursting and horizontal directional drilling applications shall conform to SDR 17, unless otherwise shown on the Plans. Pipe segments shall be butt fused together.

207-19.2 Material Composition. ADD the following:

PE pipe used in pipe bursting and horizontal directional drilling applications shall have a PPI rating of PE3408, when compounded. The pipe shall have a minimum cell classification of 345464E. Inner wall shall be light in color.

207-20.2 Materials. ADD the following:

CCFRPM pipe shall conform to the minimum pipe stiffness requirements contained in 207-20.5, "Chemical Resistance and Physical Testing" which is the minimum pipe stiffness value at the end of service life of 50 years, (60 years for storm drains).

207-20.7 Pipe Acceptance or Rejection. ADD the following:

For the purpose of these specifications, a lot is defined as 400' feet but no more than 50 sections of pipe, or fraction thereof, of one size and class manufactured on consecutive Working Days. If the 400', but no more than 50 sections of pipe are not made on consecutive Working Days, then only those made on consecutive Working Days shall be considered a lot. If an interruption in manufacturing occurs, the Engineer may permit the pipe made after the interruption to be included in the lot, provided that the interruption lasts less than 7 days and no other pipe is manufactured on that machine in the interim period. A new lot number will be assigned if any change occurs in size or spacing of reinforcing materials, in the mix, or in the curing method.

207-20.8 Installation. ADD before first paragraph:

Each section of pipe shall be moved or installed using approved non-metallic slings. The slings shall support each pipe section at a minimum of 2 locations in such a way that the pipe is not damaged by flexure or abrasion. The Contractor shall submit detailed drawings of slings proposed for the handling of the pipe during production, loading, unloading, and installation.

ADD the following at end of Section:

The installation depth of CCFRPM pipe shall be limited to a minimum cover of 5' to a maximum of 15' including cover, unless a special design is approved by the Engineer.

ADD: 207-25 POLYVINYL CHLORIDE (PVC) PRESSURE PIPE.

207-25.1 PVC Pressure Water Pipe 4"-12". Pipe shall conform to the requirements of AWWA C900. Milled over all (MOA) polyvinyl chloride pipe having asbestos cement pipe size 8" through 12" may be used only where a shorter than standard length is needed to make a connection to the existing water main.

Design and installation shall comply with AWWA Manual M-23, "PVC Pipe Design and Installation," with the following exceptions:

- a) Dimensions for PVC pipe shall comply with Table 2 of AWWA C900-07 for CI pipe equivalent OD.
- b) Pressure and SDR rating shall be class 235 and 18, respectively unless higher pressure class is called out on the Plans.
- c) Pipe ends shall be plain by elastomeric gasket bell or plain by plain. Coupling for plain pipe shall be furnished with 2 elastomeric gaskets. For pipe to pipe connections, solvent cement or mechanical joints shall not be accepted.
- d) Installation of mechanical joint shall conform to Appendix A of AWWA C111. Over stressing of bolts to compensate for poor installation shall be avoided. Bolts and nuts shall be coated with rust-preventive grease.
- e) Solvent cement joints or push-on joints will not be accepted.

207-25.2 PVC Pressure Water Pipe 14"-36". Pipe shall conform to the requirements of AWWA C905.

Design shall comply with accepted standards for PVC pipe and the following enhancements and exceptions:

- a) Pipes shall carry a safety factor of 2.5. Calculations and data from the pipe manufacturer showing that the pipe conforms to the design requirements of AWWA C900 shall be submitted to the Engineer for approval prior to ordering pipe.
- b) Dimensions for PVC water pipe shall comply with Table 2 of AWWA C905 for CI pipe equivalent OD
- c) Minimum acceptable Pressure Rating(s) (PR) and/or Dimension Ratio(s) (DR) for pressure water pipe are shown on the plans. Pipe shall have a minimum DR of 18.
- d) Fittings shall have mechanical joints, in conformance with 207-25, "POLYVINYL CHLORIDE (PVC) PRESSURE PIPE" as revised herein. Solvent cement joints or push-on joints shall not be used.

207-25.3 Chlorinated Poly Vinyl Chloride (CPVC). CPVC pipes in ½" to 2" diameters manufactured by Saudi Industries for Pipes Company Limited (SIP) between March 2007 and October 2007 shall not be used for potable water on this Project unless the piping material has been clearly certified by NSF International.

207-25.4 PIPE (SEWER). Pipe installed as sewer main shall be Vitrified Clay Extra Strength (VCES) in accordance with 207-8, "Vitrified Clay Pipe" or Polyvinyl Chloride (PVC) in accordance with 207-17, "PVC Plastic Pipe". PVC pipe shall be SDR-35 unless otherwise designated on the plans.

Pipe and fittings for house connection sewer (laterals) shall be VCES, PVC, or Acrylonitrile-Butadiene-Styrene (ABS) solid wall pipe in accordance with 207-16, "ABS or PVC Composite Pipe."

207-25.5 PIPE (WATER). Asbestos cement pressure pipe (Section 207-7) shall not be acceptable. PVC pressure pipe in accordance with 207-25, POLYVINYL CHLORIDE (PVC) PRESSURE PIPE is acceptable for sizes 16" through 36" in diameter.

ADD: 207-26 PIPE Appurtenances. Valves shall have internal and external fusion bonded epoxy coating in accordance with AWWA, C116 and C213.

207-26.1 Water Services 2" (50 mm) and Smaller. Concrete water meter boxes shall not be used for services 2" and smaller. The following shall be used for water meter boxes:

207-26.1.1 Polymer Concrete Water Meter Boxes. Boxes shall be makes and models which have been approved by the City. Enclosures shall be manufactured from a reinforced polymer concrete and fiberglass reinforced polyester with all top surfaces being polymer concrete or cast iron in accordance with City of San Diego Standard Drawings. The top surface of the cover shall have a minimum static coefficient of friction of 0.05.

Boxes and covers to be installed in traffic areas shall have a cast iron frame and cover designed for AASHTO H-20 traffic loading. Boxes and covers to be installed in non-traffic areas shall have cast iron reader lids that open less than 90 degrees and be designed for A-10 traffic loading in accordance with ASTM-C857. Traffic areas are defined as any location in which vehicular traffic is evident or highly likely under normal conditions. Non-traffic areas are locations with no vehicular traffic. Covers shall have a logo reading "SDWD WATER" as well as the manufacturer's name or logo cast in the polymer concrete surface. A cover and lid selected at random shall be tested. The cover and lid shall support without failure a total vertical load of at least 1,000 pounds, when supported in a horizontal position in the meter box. The load shall be applied to the center of the lid by a cylindrical pin, 1.952" in diameter, supported on a 2-thick rubber pad.

Unless provided for as a separate Bid item, payment for Polymer Concrete Box shall be included in the Bid item for water services.

207-26.1.2 Corporation Stops, Curb Stops, and other Bronze Water Service Fittings. Bronze water service fittings including stops shall be cast of high grade bronze conforming to the requirements of ASTM Standard Specification B 62. The Engineer shall have the right to take one or more from each lot of stops and/or fittings and have it analyzed. Fittings shall be of makes and models, which have been tested and approved by the City.

207-26.1.3 Copper Tube. Copper tube shall conform to the requirements of ASTM Standard Specification No. B 88, for Seamless Copper Water Tube, Type K soft. It shall be of the size indicated on the drawings and/or called for in the specifications.

207-26.1.4 Insulation. Copper services which are attached to metallic water mains shall be insulated as follows: The corporation stop and the copper tube and fittings within a minimum distance of 3' (0.9m) of the main shall be wrapped tightly with an approved polyvinyl chloride pipe coating tape combined with the application of a liquid adhesive primer or finish coating recommended for the purpose by the manufacturer of the tape.

The tape and adhesive or coating shall be applied in the manner and sequence recommended by the manufacturer. Prior to application of insulation, the tubing, fittings, corporation stop and the surface of the main within 4' (1.2 m) of the stop shall be thoroughly cleaned of all dirt and grease, and dried.

Copper tube shall be wrapped with tape two inches 2" (50 mm) or less in width lapped not less than 3/8" (9.5 mm).

The tape shall be not less than 0.25 mm (10 mils) in thickness and shall have the following characteristics:

Tensile strength	3,500 to 4,200 psi (24 to 30 megapascal)
Tear resistance	High
Elongation at break	300% to 350%
Moisture absorption	0.03%
Dielectric strength	750-1,000 volts/mil
Insulation resistance	200,000

207-26.1.5 Polyvinyl Chloride Pipe 2" Only. Polyvinyl chloride (PVC) pipe for water services shall meet the requirements of ASTM D 2241 plastic pipe (SDR-PR) and Class T, or ASTM D 1785 plastic pipe (schedule 40, 80, 120). The pipe shall be extruded from polyvinyl chloride compounds, meeting the requirements of ASTM D 1784.

The pipe shall be of the type and compound listed below:

<u>Standard</u>	<u>Pipe Description</u>	<u>Compound</u>
ASTM D2241	SDR = 17	PVC 1120 or 1220
ASTM D1785	PR = 530	
ASTM D1785	Schedule 40	PVC 1120 or 1220

Fittings for polyvinyl chloride pipe shall be socket solvent weld type meeting the requirements of ASTM D2466. The welding solvent shall meet the requirements of ASTM D2564.

Polyvinyl chloride pipe, fittings and solvents shall be approved by the National Sanitation Foundation for use in transporting potable water and shall be supplied by manufacturers approved by the City.

207-26.2 Fire Hydrants. Fire hydrants furnished in accordance with these specifications shall conform to the provisions of AWWA C503 for "Wet Barrel Fire Hydrants", and to the modifications and supplements herein.

Valve seats and stem guides may be threaded into or cast into the hydrant body or may be secured to the body by means of a lock nut.

Unless otherwise specified, fire hydrants for residential areas shall have one 4" port and one 2.5" port and fire hydrants for commercial and industrial areas shall have two 4" ports and one 2.5" port.

Hydrant valves shall open counter clockwise.

Threads for pumper and hose nozzles shall conform to the American National Standard adopted by the American Insurance Association (formerly the National Board of Fire Underwriters) and the National Fire Protection Association published in pamphlet No. 194, Fire Hose Couplings, by N.F.P.A. in 1968.

Outer end of all hose coupling threads shall be terminated by the blunt start of "Higbee Cut" on full thread (to avoid crossing thread).

Hydrant body base flange shall be drilled in a 9.5" (237.5 mm) bolt circle with six bolt holes, 7/8" (22 mm) in diameter oriented to the center of the pumper connection.

Hydrant bodies shall be solid bronze. The cap materials shall be cast iron or bronze.

Valve stems shall have a pentagon end and shall have a short radius of 33/64" (13 mm) to center of flat sides.

Hydrant components made from brass or bronze shall be of a grade containing not more than 16 percent zinc and not more than 2 percent aluminum in accordance with Section 2.6.4 of the AWWA Standard C 503 for waters with specific conductance exceeding 350 micro Mho per am.

Exterior surfaces shall be painted with a zinc chromate primer of the same color as the finished coat. The finished coat shall be of chrome yellow enamel meeting the requirement of Federal Specification TT-C-595, Color No. 13538.

Removal of existing Fire Hydrant and all appurtenant work shall be included in the Bid item for Fire Hydrant.

207-26.3 Gate Valves. Gate valves shall conform to the provisions of AWWA Specification C 500 as modified herein, except that valves 3" (75 mm) and under shall be all bronze; conforming to ASTM B62.

Valves shall have bottom or side wedging double discs, parallel seats, all bronze internal working parts, either "O" rings or stuffing box stem seals, and two inch square operating nut, and shall open by turning the stem counter-clockwise. Ends shall be as specified, designed for use with the connecting pipe. Components made from brass or bronze shall be of a grade containing not more than 16% zinc and not more than 2 percent aluminum in accordance with 5.5 of the AWWA Standard C 500 for waters with specific conductance exceeding 350 micro Mho per am.

Valves 16" (400 mm) and larger shall be designed for horizontal mounting, with 3" (75 mm) by-passes and totally enclosed gear case. Integral or extended gear cases are acceptable.

External bolts and nuts for valve fittings shall be hexagonal head machine bolts and hexagonal nuts conforming to ASTM 307, Grade B or SAE Grade 2. Bolt threads shall be lubricated with graphite and oil prior to installation.

By-pass connections for all gate valves over 12" (300 mm) shall be cast into the valve and shall not obstruct the water way to the by-pass. Bronze by-pass valves shall be wheel operated.

Only gate, resilient-seated gate and butterfly valves are allowed. Valves used with PVC pipe shall have mechanical joint ends.

Sixteen-inch gate valves shall have a 3" bypass when the maximum operating pressure is 80 psi or greater; larger gate valves shall have bypasses in accordance with AWWA C-500.

Painting of exposed surface of valve well caps shall be in accordance with the Gate Well Identification Standard Drawing, for Valves 4" (100mm) and Larger."

Valve key extensions shall be installed for butterfly valves and gate valves when top of gate valve nut is 6' or more below ground or pavement surface. Types of joints for fittings are called out on Plans in the following order: back, ahead, left, right.

207-26.4 Butterfly Valves. Butterfly valves and operators shall conform to the provisions of AWWA C504, "Standard for Rubber-Seated Butterfly Valves", as modified and supplemented herein.

Valves and operators shall be Class 150B, totally enclosed for direct burial in the ground without a vault. Valves and operators shall be designed for installation in a nearly horizontal pipeline with the disc shaft horizontal and the operating shaft vertical. Valves shall be either short body, or long body, with ends as specified. Flanged ends shall conform to AWWA C207. All 16" and larger butterfly valves shall have by-pass.

The operator shall be manual with a 2" (50 mm) square operating nut, and shall open the valve when turned counter-clockwise. The number of turns required to fully close the valve from a fully open position is shown in the table below for valve diameter 6" (150 mm) to 48" (1200 mm).

Valve Diameter inch (mm)	Minimum Number of Turns to Close
6 (150)	15
8 (200)	18
10 (250)	24

12 (300)	26
14 (350)	28
16 (400)	30
18 (450)	32
20 (500)	36
24 (600)	42
30 (750)	48
36 (900)	56
42 (1050)	64
48 (1200)	72

The operator, and any other parts requiring lubrication, shall be fully lubricated at the factory and shall require no additional lubrication for the life of the valve.

The valve disc may be of cast iron, alloy cast iron, stainless steel, monel, bronze, or ductile iron. The metal seating surfaces which meet the rubber seat shall be of stainless steel or bronze.

Bolts and nuts for valve end flanges shall be hexagonal head bolts and hexagonal nuts conforming to ASTM 307, Grade B or SAE Grade 2. Bolt threads shall be lubricated with graphite or oil prior to installation.

Prior to the installation of working parts, all internal steel or cast iron surfaces of valves, except finish or bearing surfaces, shall be coated with approved epoxy in accordance with AWWA C550, "Protective Interim Coatings for Valve and Hydrants." The epoxy surface shall be tested with an approved holiday detector.

207-26.4.1 Class 250B Butterfly Valves. This subsection applies to 16" (400 mm) through 54" (1350 mm) Class 250B butterfly valves.

Butterfly valves shall conform to the requirements of AWWA C504 for Class 250B service in terms of performance criteria. Class 250B Butterfly valves shall have flanged ends, be manually operated, tight closing, and have rubber seats. Valves shall be bubble-tight at the rated pressure with flow in either direction, and shall be satisfactory for applications involving throttling service and/or frequent operation after long periods of inactivity. Valves and valve operators shall be suitable for buried service. Valves and valve operators shall comply with these specifications, other accepted standards for butterfly valves, and the following enhancements and exceptions:

- a) Valve Bodies shall be short and constructed of cast iron conforming to ASTM A 126 Class B. Flanges shall be flat-faced and flange drilling shall be in accordance with ANSI B16.1, Class 125 or Class 250, as required for the design pressure. On valves 30" (750 mm) and larger the valve port diameter shall not reduce more than a 1.5" (37.5 mm) of nominal diameter. Flow direction shall be indicated on the valve body. The use of stops or lugs cast integrally with or mechanically secured to the body for limiting disc travel shall not be acceptable.
- b) Valve Disc shall have no external ribs transverse to the flow of water through the valve. The disc shall not have any hollow chambers that can entrap water. The disc shall be made from cast iron ASTM A 126 Class B or ductile iron ASTM A 536. The disc shall be furnished with a nickel-chrome or stainless steel type 316 seating edge to mate with the rubber seat.
- c) The Valve Seat shall be attached to the valve body. Retaining rings, clamps, screws and bolts attaching the rubber seat to the valve body shall be fabricated from stainless steel type 316. For valves 24" (600 mm) and larger, valve seats shall be field adjustable around the 360 degree circumference and replaceable without dismantling the operator, disc or shaft and without removing the valve from the pipeline. The valve manufacturer shall certify the rubber seat is field replaceable as specified above. Spool-type rubber liners covering the entire surface of the valve body and extending over any portion of the flange faces will not

be acceptable. Valves employing the use of snap rings to retain the rubber seat will not be acceptable.

- d) Rubber for valve seats shall conform to the applicable provisions of AWWA C 504.
- e) Valve shafts shall be stainless steel ASTM A 564 Type 630 Condition H-1100.
- f) The valve/disc connection shall be made through the use of on-center taper pins. The taper pins shall be of the same material as the valve shaft.
- g) Shaft Seals shall be standard split V packing and be provided where the shaft Projects through the valve body. Shaft seals shall be of design allowing replacement without removing the valve shaft.
- h) Valve Bearings shall be sleeve type that is corrosion resistant and self-lubricating. Thrust bearings shall be provided in accordance with the governing standard. Thrust bearings, which are exposed to water and consist of a metal bearing surface in rubbing contact with an opposing metal bearing surface, shall not be acceptable.
- i) Valve Operator shall be fully grease packed and have stops in the open/closed position. The operator shall have a mechanical stop, which will withstand an input torque of 450 ft lbs. (610 Newton-meter), against the stop. The traveling nut shall engage alignment grooves in the housing. The operator shall have a built in packing leak bypass to eliminate possible leakage into the operator housing. The operator shall be designed to hold the valve in any intermediate position between fully open and fully closed without creeping or fluttering. The operator shall be sized to provide adequate torque to operate the valve on which it is mounted at the full pressure rating of the valve. Operators shall meet minimum requirements for AWWA C504.
- j) Valve Operator shall be mounted on the valve at the valve manufacturer's facility. The valve manufacturer shall insure proper operator sizing and satisfactorily test the operator and valve assembly prior to shipment to the Site.
- k) Valves shall be hydrostatic and leak tested. The leak test shall be performed in both directions at a differential pressure of 250 psi (1.7 Megapascal) with the disc in a closed position. In a slightly open position, internal hydrostatic pressure equal to 500 psi (3.45 Megapascal) shall be applied to the inside of the valve body for 5 minutes. Proof of a design cycle test in accordance with AWWA C 504 Section 5.2.4.3 shall be submitted before installation.

ADD: 207-26.5 Plug Valves. Class 250 valves, 16" or larger shall be plug valves. This grouping includes cone valves, ball valves and eccentric plug valves.

ADD: 207-27 FUSIBLE NON-PRESSURE POLYVINYLCHLORIDE PIPE.

207-27.1 General. This subsection specifies fusible polyvinylchloride pipe for sewer mains and laterals when used for horizontal directional drilling.

207-27.2 Material. Fusible polyvinylchloride plastic material for pipe shall conform to ASTM D3034 or ASTM F679, and ASTM D1784 cell classification 12454. Fusible polyvinylchloride pipe shall be tested at the extrusion facility for properties required to meet all applicable parameters.

Fusible polyvinylchloride pipe shall be extruded with plain ends. The ends shall be square to the pipe and free of any bevel or chamfer. There shall be no bell or gasket of any kind incorporated into the pipe.

Pipe shall be homogeneous throughout and be free of visible cracks, holes, foreign material, blisters,

or other deleterious faults. Any length of pipe showing a crack or which has received a blow that may have caused an incident fracture, even though no such fracture can be seen, shall be marked as rejected and removed from the Site immediately. Damaged areas, or possible areas of damage may be removed by cutting out and removing the suspected incident fracture area. Limits of the acceptable length of pipe shall be determined by the Engineer.

Any scratch or gouge greater than 10% of the wall thickness shall be considered significant and will be rejected unless determined acceptable by the Engineer.

Pipe segments shall be butt fused together.

Fusible polyvinylchloride pipe shall be manufactured with 100% virgin resin in a standard 20', 30' or 40' nominal length with the following general characteristics:

- a) Color: Green (for wastewater applications)
- b) SDR: 18 minimum, unless otherwise shown on the plans

207-27.2.3 Submittals. The Contractor shall submit the following product data from the pipe supplier or fusion provider in accordance with 2-5.3, "Submittals:"

- a) Name of the pipe manufacturer and a list of the materials to be provided by manufacturer. This shall include:
 - i. Pipe Size
 - ii. Dimensionality
 - iii. Pressure Class per applicable standard
 - iv. Color
 - v. Recommended Minimum Bending Radius
 - vi. Recommended Maximum Safe Pull Force
- b) Written procedural documentation for piping products including proper handling and storage, installation, tapping, and testing.
- c) Couplings to be utilized in the installation.

207-27.3 Connections for Gravity Sanitary Sewer Applications. The following connections shall be used in conjunction with tie-ins to existing gravity sewer piping as shown on the Plans.

207-27.3.1 PVC Gasketed Push-On Couplings. Acceptable couplings for joining fusible polyvinylchloride pipe to other sections of fusible polyvinylchloride pipe or other sections of PVC pipe shall include gasketed PVC, push-on type couplings.

207-27.3.2 Sleeve-Type Couplings. Sleeve-type mechanical couplings shall be manufactured for use with PVC pipe, and may be restrained or unrestrained as indicated on the drawings and in these specifications. Acceptable sleeve-type mechanical pipe couplings shall include for unrestrained coupling Smith-Blair Omni-Coupling, Dresser Style 253 or Long Style 253 or approved equal.

Acceptable sleeve-type mechanical pipe couplings shall include EBAA Iron Series 3800 or approved equal restrained couplings.

207-27.3.3 Expansion and Flexible Couplings. Expansion-type mechanical couplings shall be manufactured for use with PVC pipe, and may be restrained or unrestrained as shown on the Plans or required in these specifications.

Acceptable expansion-type mechanical pipe couplings shall be EBAA Iron EX-TEND 200, Smith-Blair Type-611 or Type-612, or approved equal.

Acceptable flexible couplings shall be EBAA Iron FLEX-TEND or approved equal.

207-27.3.4 Connection Hardware. Bolts and nuts shall be made of non-corrosive high-strength, low-alloy steel having the characteristics specified in ANSI/AWWA C111/A21, regardless of any other protective coating.

207-27.4 Pipe Markings. Delivered pipe markings shall include as a minimum:

- a) Nominal size
- b) PVC
- c) Dimension Ratio, Standard Dimension Ratio or Schedule
- d) Extrusion production-record code
- e) Trademark or trade name
- f) Cell Classification
- g) ASTM D3034 or ASTM F679

207-27.5 Handling and Storage. The pipe shall be handled per manufacturer recommendations and stored at ambient temperature and protected from ultraviolet light degradation.

SECTION 209 – STREET LIGHTING AND TRAFFIC SIGNAL MATERIALS **(Caltrans Standard Specifications, Section 86)**

DELETE GREENBOOK, Section 209 in its entirety and SUBSTITUTE with the following:

Unless otherwise specified, signal, lighting, and electrical system materials and installation work shall be done in accordance with Section 86 of the May, 2006 Standard Specifications and in accordance with the May, 2006 Standard Plans of the Caltrans, except as herein amended. References to other Sections 10 through 95 of the Standard Specifications of the State of California shall apply where shown in Section 86. References in the State Standard Specifications to the State of California, its agencies, or agents shall be construed to refer to the City, its corresponding agencies, or agents.

These specifications shall be used in conjunction with Section 307, "STREET LIGHTING AND TRAFFIC SIGNAL SYSTEMS" of these specifications.

The section numbers starting with "86" correspond to the same subsection in Section 86 of the Standard Specifications of Caltrans.

209-1 (86-2) Materials and Installation.

209-1.1 (86-2.03.01) Foundations. Spacers shall be inserted between the reinforcing steel cage and the form to ensure that the specified clearance is maintained.

209-1.2 (86-2.04A) Standards, Steel Pedestals, and Posts. Standards, regardless of diameter, shall be round unless otherwise noted. Steel standards shall be galvanized (whether or not they are painted). Aluminum 1-A poles, where indicated on the Plans, shall be fabricated of seamless tubing conforming to 6063-T6 wrought aluminum alloy specifications of the Aluminum Association. The base of the post shall be a minimum of 150 mm (6 inches) O.D. tapering to 115 mm (4½ inches) O.D. at the top. The wall thickness of the shaft shall be a minimum of 6 mm (¼ inch). Ornamental anchor bolt nut covers shall be provided for all traffic signal and/or lighting standards and posts. Edges shall have minimum 25 mm (1-inch) radius.

209-1.2.1 (86-2.04B) Mast Arm Replacement or Modification. Welding of mast arms and qualification of welders shall conform to AWS D1.1, "Structural Welding Code." Tenon shall be mechanically held in relation to the mast arm before welding tenon. Welds and damaged galvanized surfaces of modified mast arms shall be painted with 2 applications of zinc-rich primer as provided in Section 75-1.05, "Galvanizing," of the Standard Specifications. The second application shall be applied at the installation site.

At each mast arm replacement location, a new or completely modified mast arm shall be on hand and ready for installation before closing traffic lanes or ramps. Luminaires installed on modified mast arms shall be adjusted to be tipped up 5 degrees from the horizontal, or as directed by the Engineer.

209-1.2.2 (86-2.04C) Concrete Poles. The ultimate strength shall be calculated in accordance with the latest revision of ACI-318 utilizing a load factor of 2. Under working load (including wind loading) the pole must not be stressed beyond the cracking strength. Wind loads shall be as specified in the latest edition of the AASHTO Standards.

Poles shall be tapered, centrifugally cast, and pre-stressed. They may be round or octagonal, black and white marble aggregate or natural exposed aggregate, direct burial or anchor base type. The minimum outside diameter or dimension of direct-burial poles shall be 125 mm (5 inches) at the top and 225 mm (9 inches) at the bottom. Pole shape and color shall be uniform for any one project. Replacement poles shall match existing. Aggregates shall conform to current requirements of ASTM C33, except that abrasion requirements therein shall not apply and that no more than 7% shall be smaller than 140 μ m (pass a No. 100 mesh sieve). No dye or sealer shall be used without approval of the City.

The centrifugal casting process shall produce a center duct throughout the length of the pole. The duct shall be free from sharp projections or edges which might injure the wire or cable. It shall have a minimum diameter of 25 mm in 125 mm (1 inch in 5-inch) top diameter poles and 38 mm in 150 mm (1½ inches in 6-inch) top diameter poles. All reinforcing steel shall have a minimum cover of 16 mm.

Four galvanized bar studs shall extend approximately 25 mm (1 inch) above top of standard for attachment of bracket arm. These studs shall be sufficiently embedded so as to provide sound anchorage for the mast arm and luminaire under working loads. Other methods of attachment may be used, with the Engineer's approval.

After curing, the surface of the standard shall be treated to remove cement laitance and develop the surface texture. When finished, poles shall be without cracks or brazing and shall have a uniform surface (without objectionable mold marks) and texture throughout the entire length. Maximum deviation from string line at any point shall not exceed 2.5 mm per meter (0.03-inch per foot) of length.

Direct burial poles furnished with sand and gravel aggregate shall have a concrete finish free from fins or other imperfections and shall have a finish equal to Class 1, see 303-1.9.3, "Class 1 Surface Finish." At the base of the concrete standard, the pre-stressing steel shall be cut off 3 mm (c inch) minimum below the surface. The exposed ends of the pre-stressing steel and the base of the light standard shall be heavily coated with roofing asphalt or coal tar enamel.

Reinforcing steel, cables, deformed bars, base plates, anchor bolts, and stud bolts shall be electrically bonded together. Mast arms shall be positively bonded to stud bolts, reinforcing steel and cables, or both by welding or brazing of steel materials, or brazing or mechanically connecting copper strap to steel members. A 6 mm (¼") hot dip galvanized or stainless steel bolt, accessible through the access

holes, or a copper strap brazed or mechanically connected to the reinforcing steel shall be provided to ground direct burial poles.

209-1.2.3 (86-2.04D) Fiberglass Lighting Standards. Where indicated on the Plans, standards utilizing fiberglass-reinforced thermosetting plastic (FRP) poles may be substituted for steel lighting standards as provided below:

Table 209-1.2.3(A)

Steel Standard	FRP Equivalent
Type 15	Type 15F
Type 15 with Slip Base	Type 15F (Breakaway)
Type 21	Type 21F
Type 30	Type 21F
Type 30 with Slip Base	Type 21F (Breakaway)

Fiberglass lighting standards shall consist of round, fiberglass-reinforced thermosetting plastic poles with aluminum mast arms. FRP poles shall be hollow, tapered or with tapered sections, non-conductive and chemically inert.

FRP lighting standards shall conform to the details shown on the plans, and shall comply with requirements in the AASHTO manual titled "Standard Specifications for Structural Supports for Signs, Luminaires, and Traffic Signals" (2009) and ANSI Roadway Lighting Document C136.20, "Fiber-Reinforced Plastic (FRP) Lighting Poles."

FRP lighting standards specified as "Breakaway" types shall also comply with the requirements in the National Cooperative Highway Research Program Report 230, "Recommended Procedures for the Safety Performance Evaluation of Highway Appurtenances." Design wind velocity for lighting standard systems shall be 100 mph.

The Contractor shall provide the Engineer a Certificate of Compliance from the manufacturer in accordance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The certificate shall also include a copy of all applicable test reports on the lighting standards. The test reports shall be signed by the manufacturer's management person responsible for the tests. The certificate shall also certify that the lighting standards comply with the requirements of the specifications and were manufactured in accordance with the approved testing and quality control program.

Each standard shall have an identification plate conforming to the provisions in the second paragraph of Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications. The identification plate shall show the standard type, manufacturer's name, manufacturer's part number and the year of fabrication. If the lighting standard is a breakaway type, the identification plate shall include the word "BREAKAWAY". The plate shall be located either on the anchor base or just above the handhole.

The pole shall be constructed of continuous fiberglass filaments combined with thermosetting polyester, ultraviolet-resistant resin. The fiberglass and resin ratio shall contain at least 65% glass and 35% resin by weight. The glass filament shall be helically wound under tension at angles to provide axial strength. The pole shall be flame resistant in accordance with ASTM D635. The resin shall be pigmented light gray and be of uniform color throughout the entire body of the pole. The finish of the pole shall be smooth.

Each pole shall have a handhole and handhole cover, bearing the name of the manufacturer. The handhole cover shall be securely attached to the pole with tamper-resistant hardware. The handhole shall be located on the side away from the mast arm. The pole shall be reinforced in areas of hand holes, conduit entrance opening, and mast arm connection.

The pole shall be smooth, round and uniformly tapered above ground and anti-rotation shaped below ground. The pole shall be direct burial or anchor base as specified on the plans. Each standard shall be provided with a removable aluminum or galvanized steel pole top cap.

The base shall be bonded to the pole with a suitable adhesive, and coated with an aliphatic-type acrylic-modified polyurethane finish. For new installations, adaptor plates shall not be used to attach the standard to the foundation.

FRP lighting standards that are not specified as "Breakaway" types shall not have the machined groove inside the anchor base casting as shown in the "Aluminum Anchor Base Elevation" detail shown on the plans.

Direct burial poles shall have a 50 mm x 150 mm (2-inch x 6-inch), nominal size, grommetted conduit/conductor entrance located 600 mm \pm 25 mm (2 feet \pm 1 inch) below finished grade after installation. The entrance shall be located directly below the handhole. The butt end of the direct-burial pole shall be flared, or modified by some other acceptable means, to increase the resistance to rotation and pullout and provide additional ground bearing resistance.

The pole, with specified luminaire and mast arm installed, shall withstand the bending strength test load shown in the following table. The pole shall withstand this load with the handhole in compression. The pole shall not exceed a maximum deflection of 13 percent of the length of the pole above the ground line when subjected to the deflection test load shown in the following table:

209-1.2.3(B) Test Load Table

Standard Type	Bending Strength Test Load	Deflection Test Load
Type 15F, Type 15F (Breakaway)	2406 N (540 pounds)	1606 N (360 pounds)
Type 21F, Type 21F (Breakaway)	2562 N (575 pounds)	1708 N (385 pounds)

Test loads shall be applied according to Section 12, "Pole Deflection Measurements," of ANSI C136.20. Poles shall be loaded 300 mm (12 inches) below the tip.

In addition to the requirements stated above, aluminum mast arms shall comply with requirements in the Aluminum Association's Publication 30, "Specifications for Aluminum Structures." Length of mast arm shall be as shown. Outer end of the mast arm shall be provided with a 70 mm (2¾-inch) O.D. slipfitter, 150 mm (6 inches) long.

An aliphatic-type acrylic-modified polyurethane coating shall be applied to the exterior of the fiberglass pole. The coating shall be semi-gloss, highly weather resistant and light gray in color matching the color of the resin and shall have a minimum 0.075 mm (3 mils) dry film thickness. A one liter (1 quart) can of the coating to match the poles shall be supplied with each order of poles. The polyurethane coating shall be tested for adhesion to the pole surface in accordance with the requirements of ASTM Designation: D 3359, Method A and shall have a scale rating of 5A. The adhesion testing shall be conducted before and after the accelerated weathering evaluation.

The finished surface of the pole shall be capable of withstanding a minimum of 2,500 hours of accelerated weathering when tested in accordance with the requirements of ASTM Designation: G

53. Lamps shall be UV-B (313 nm wavelength). The testing cycle shall be 4 hours of ultraviolet (UV) exposure at 60 °C (140 °F) and then 4 hours of condensate exposure at 40 °C (100 °F).

After testing, the finished surface of the pole shall exhibit the following:

Table 209-1.2.3(C)

Fiber exposure:	None
Crazing:	None
Checking:	None
Chalking:	Very slight
Change in color:	May dull slightly

Each pole shall be spiral wrapped in its entirety with a weatherproof wrap for protection during shipping and storage.

Installation and backfilling for direct burial poles shall be as provided for wood poles in Section 86-2.12, "Wood Poles," of the Standard Specifications. The pole butt end shall be embedded into the ground 1.5 m (5 feet) deep.

Each FRP lighting standard shall have its luminaire, mast arm, and anchor bolts effectively grounded as provided in Section 86-2.10, "Bonding and Grounding," of the Standard Specifications. A separate bonding connection to the mast arm will not be required provided there is non-insulated contact between the luminaire and the mast arm.

209-1.2.4 (86-2.04E) Fiberglass Type 1-A Traffic Signal Standards. Fiberglass Type 1-A standards shall conform to dimensions shown on State Standard Plan ES-7B.

The design of the pole assembly shall use latest edition of AASHTO "Standard Specification for Structural Supports for Highway Signs, Luminaires and Traffic Signals" when calculating maximum expected wind loading. The pole shall be designed to not deflect more than 5% when loads are applied.

The pole shall be smooth, round and uniformly tapered. The pole shall be constructed of continuous fiberglass filaments combined with thermosetting polyester resin. The fiberglass and resin ratio shall contain at least 65% glass and 35% resin by weight. The glass filament shall be helically wound under tension at angles to provide axial strength. The pole shall be reinforced in areas of hand holes. A coating shall be applied to the pole surface to maintain surface integrity against the effects of sunlight and extremes in the weather. The pole resin and surface coating shall be gray unless otherwise noted. The pole shall be flame-resistant in accordance with ASTM D635. A 6.5 mm x 13 mm (2½-inch by 5-inch) oval hand hole with cover plate shall be located in the pole a minimum of 300 mm (12 inches) above the base plate.

209-1.3 (86-2.05E) Conduit. When approved by the Engineer, conduit runs shown on the plans to be located behind curbs may be installed in the street, within 4 feet of and parallel to the curb, by narrow trenching. All pull boxes shall be located behind the curb or at locations shown on the plans. Narrow trenching shall be Type "A" or Type "E" as shown in the San Diego Regional Standard Drawings SDG 116 and SDG-118, except that the top of the conduit shall be installed a minimum of 18 inches below the pavement surface or three (3) inches below the bottom of pavement, whichever is greater. Any changes in conduit location shall be approved in advance by the Engineer.

Conduit to be installed underground shall be Type 3 unless otherwise specified. Detector termination conduits shall be Type 3.

The conduit in a foundation and between a foundation and the nearest pull box shall be Type 3.

After conductors have been installed, the ends of conduits terminating in pull boxes, and in service and controller cabinets shall be sealed with an approved type of sealing compound.

Pull ropes for use when installing cables in Type 3 conduit shall consist of a flat, woven, lubricated, soft-fiber polyester tape with a minimum tensile strength of 8,000 N (1,800 pounds) and shall have printed sequential measurement markings at least every 3 feet.

At the option of the Contractor, the final 2 feet of conduit entering a pull box in a reinforced concrete structure may be Type 4.

209-1.4 (86-2.06) Pull Boxes. Non-PCC pull boxes shall only be used where specifically shown on the plans. A No. 3½ pull box shall be installed immediately adjacent to each street light pole. A No. 3½ pull box shall be installed at each end of a street lighting conduit run crossing a street. A No. 6 pull box shall be installed immediately adjacent to each signal pole. Unless otherwise shown, ¾-inch gravel shall be placed in bottom of pull boxes. Pull boxes shall not be installed in surfaces subject to vehicular traffic unless approved by the Engineer. A 4-inch diameter white ceramic raised pavement marker shall be installed on the face of the curb or asphalt dike adjacent to pull box installed in soil. The cover of the pull box shall be stamped with the words "TRAFFIC SIGNAL," "STREET LIGHT," or "COMMUNICATIONS," as appropriate.

209-1.4.1 (86-2.06D) Type 15 Pull Boxes. Type 15 pull boxes and extensions shall conform to the Western Underground Committee Recommended Guide No. 3.6, "Non-Concrete Enclosures." Type 15 pull boxes shall be 30 inches wide x 48 inches long x 18 inches deep (nominal inside dimensions). Each pull box shall have one 200 mm (8-inch) or 400 mm (16-inch) extension. Hold down bolts or cap screws and nuts shall be of brass, stainless steel or other non-corroding metal material. Cover marking shall be "COMMUNICATION." Enclosures, covers and extensions shall be concrete gray color.

Type 15 pull boxes shall be installed where shown on the Plans for communication system.

209-1.5 (86-2.08E.1) Fiber Optic Subsystems.

209-1.5.1 (86-2.08E.1.1) Trenching.

209-1.5.1.1 Warning Tape. Warning tape shall be provided and placed in the trench over conduits containing fiber optic cable as shown on the plans. The warning tape shall be 100 mm (4 inches) wide with bold printed black letters of approximately 18 mm (¾-inch) on bright orange color background, and contain the printed warning "CAUTION - BURIED FIBER OPTIC CABLE" repeated at approximately 750 mm (30-inch) intervals. The printed warning shall be non-erasable and shall be rated to last with the tape for a minimum of 40 years. The construction of the warning tape shall be such that it will not delaminate when it is wet. It shall be resistant to insects, acid, alkaline and other corrosive elements in the soil. It shall have a minimum of 530 N (120 pounds) tensile strength and shall have a minimum of 700% elongation before breakage.

The warning tape shall be the detectable type with a contiguous conductor in the form of a copper wire or aluminized foil, encased in a protective plastic jacket. The aluminized foil shall be 0.35 mil thick. Separate rolls of the warning tape shall be electrically connected by corrosion resistant clips or by soldering. The ends of warning tape shall extend into pull boxes and splice vaults a minimum of 24

inches for future connection to a warning signal device. The continuity and detectability of the warning tape, for the entire conduit run, shall be demonstrated prior to, and again after backfilling each trench, to the satisfaction of the Engineer.

Warning tape shall be Condux International, Inc.; Allen System, Inc.; Reff Industries, Inc.; or equal.

209-1.5.1.2 Trace Wire. Except where a detectable warning tape will be installed, a separate trace wire shall be installed external and adjacent to the conduit along the entire fiber optic cable route for use in active cable location. The trace wire shall be a #8 AWG bare-copper solid wire. No insulation or other coating material shall be on the trace wire. The trace wire shall be terminated by connecting to the ground rods at the pull boxes as noted in the plans.

209-1.5.1.3 Colored Concrete Backfill. The concrete backfill for the trenches with conduits that will contain fiber optic cable shall be a medium-to-dark red or orange color (1 kg (2 pounds) of color pigment per sack of cement) to clearly distinguish the concrete backfill from other concrete and soil. The concrete shall be pigmented by the addition of commercial quality cement pigment to the concrete mix. The red or orange concrete pigment shall be LM Scofield Company; Orange Chromix Colorant; Davis Colors, or equal.

For trenches in pavement areas, only the top 100 mm (4 inches) of concrete backfill will be required to be pigmented concrete. At the option of the Contractor, the full depth may have the pigment.

209-1.5.2 (86-2.08E.1.2) Fiber Optic Cables.

Single Mode Optical Fibers. Single-mode optical fiber shall be Corning SMF-28™. Each optical fiber shall be glass and consist of a doped silica core surrounded by concentric silica cladding. All fibers shall be useable and shall be sufficiently free of surface imperfections and inclusions. The coating shall be a dual layered, UV cured acrylate. The coating shall be able to be stripped mechanically or chemically without damaging the fiber.

<u>Parameters</u>	<u>SM</u>
Core Mode Field Diameter (Petermann II)	
@1310 nm	9.3 ± 0.5 μm
@1550 nm	10.5 ± 1.0 μm
Core Diameter Variation	± 3 μm
Core-to-Cladding Offset	≥ 1.0 μm
Cladding Diameter	125 μm ± 2 μm
Cladding Non-circularity	≤ 1.0%
defined as: 1- (min. cladding dia. ± max. cladding dia.) x 100 Attenuation	
@ 1310 nm	≤ 0.4 dB/km
@ 1550 nm	≤ 0.3 dB/km
Chromatic Dispersion	
Zero Dispersion Wavelength	1301.5 to 1321.5 nm
Zero Dispersion Slope	< 0.092 ps/(nm²•km)
Maximum Dispersion	
@1300 nm - 1330 nm	< 2.5 ps/(nm•km)
@1550 nm	< 20 ps/(nm•km)
Cut-off Wavelength	< 1250 nm

209-1.5.3 Cable Fabrication.

209-1.5.3.1 Cable Certification. The cable manufacturer shall certify that the cable is suitable for direct installation in 30 mm to 75 mm (1¼-inch to 3-inch) conduit in an underground environment. The Engineer shall receive a sample and its certification submittal prior to installation. The Contractor shall submit laboratory test reports on representative samples of similar cable design to demonstrate compliance with the following requirements prior to cable installation:

1. Tensile Strength per EIA-RS-455-33A and EIA-RS-455-28A
2. Jacket Shrinkage per EIA-RS-455-86
3. Cable Twist per EIA-RS-455-85
4. Environmental Temperature Cycling per EIA-RS-455-3A
5. Flexing per EIA-RS-455-104
6. Impact Resistance per EIA-RS-455-25A
7. Compressive Strength per EIA-RS-455-41
8. Freezing Test per EIA-RS-455-98A
9. Mechanical Bend Test per EIA-RS-455-37

The Contractor shall provide the manufacturer's certification that the offered cable shall comply with all optical and mechanical requirements set forth in this specification. The cable manufacturer shall be ISO 9001 registered.

209-1.5.3.2 Applicable Documents. The cable shall conform to the latest issue of the following standards documents which are incorporated by reference into this specification:

- a) EIA-455 Standard Test Procedures for Fiber Optic Fibers, Cables, Transducers, Connecting and Terminating Devices.
- b) EIA-359 Standard Colors for Color Identification and Coding.
- c) MIL-202 Test Methods for Electronic and Electrical Component Parts.
- d) MIL-454 Standard General Requirements for Electronic Equipment.
- e) MIL-810 Environmental Test Methods and Engineering Guidelines.

Fiber optical cables shall be constructed in accordance with EIA-455 and 100% of all optical fibers and jacketing shall meet or exceed the requirements contained in this specification.

209-1.5.4 Mechanical Performance.

209-1.5.4.1 Fiber Proof Test. All fibers shall be 100% subjected to a minimum proof stress of 100 kpsi prior to being drawn into fiber sub-cables.

209-1.5.4.2 Minimum Bend Radius. The cable shall be able to withstand bending to a minimum radius of 10 times the cable outer diameter without tensile load applied, and 20 times the cable outer diameter with maximum load applied (during installation only), without damage to the cable components or degradation of the optical fiber performance. The fiber optic cables shall withstand at least 20 cycles at a minimum bend radius without damage to the fiber optic cable components or degradation of the optical performance. The cyclic flexing test shall be in accordance with EIA-455.

209-1.5.4.3 Cyclic Flex Resistance. The cable shall withstand cyclic flexing 2,000 times per the requirements of EIA-455-104.

209-1.5.4.4 Environmental Performance. The fiber optic cable shall comply with the requirements specified herein when subjected to the following environmental conditions.

209-1.5.4.5 Temperature. The cable shall comply with the optical and mechanical performance requirements specified herein up to 95% relative humidity (non-condensing) when subjected to moisture resistance conditioning according to Method 106B of MIL-202 except that the specimen shall not be vibrated.

The shipping and storage temperature of the cable shall be -40 °C to +70 °C, and the operating and installation temperature range of the cable shall be -40 °C to +70 °C.

209-1.5.4.6 Moisture Resistance. Optical and mechanical performance shall not be degraded and the cable shall not be damaged in any way by immersion in ground water.

209-1.5.4.7 Fungus Resistance. The outer jacket material used in construction of this cable shall be fungus inert as described in requirement 4 of MIL-454.

209-1.5.4.8 Sunlight/UV Resistance. The outer jacket material shall be suitable for long-term exposure to sunlight and weather, with a life expectancy in excess of 20 years. Suitability shall be determined in accordance with MIL-810, method 505.

209-1.5.4.9 Loose Tube Cables. Optical fibers shall be placed inside loose buffer tubes. Each buffer tube shall contain between six and twelve single mode fibers. Each fiber shall be numbered and color coded. The cable shall contain between one and 6 buffer tubes. The tubes shall be color coded.

Each fiber shall be distinguishable from other fibers in the same tube by means of color coding. Each tube shall be distinguishable from other tubes in the same cable by means of color coding. The colors shall be targeted in accordance with the Munsell color shades and shall meet EIA/TIA-598 "Color Coding of Fiber Optic Cables." The color formulation shall be compatible with the fiber coating and the buffer tube filling compound, and be heat stable. The colors shall not fade or smear or be susceptible to migration and it shall not affect the transmission characteristics of the optical fibers and shall not cause fibers to stick together.

1.Blue (BL)	5.Slate (SL)	9. Yellow (YL)
2.Orange (OR)	6.White (WT)	10. Violet (VL)
3.Green (GR)	7.Red (RD)	11. Rose (RS)
4.Brown (BR)	8.Black (BK)	12. Aqua (AQ)

209-1.5.4.10 Buffer Tubes. Clearance shall be provided in the loose buffer tubes between the fibers and the inside of the tube to allow for expansion without constraining the fiber. The fibers shall be loose or suspended within the tubes. The fibers shall not adhere to the inside of the buffer tube.

The loose buffer tubes shall be extruded from a material having a coefficient of friction sufficiently low to allow free movement of the fibers. Buffer tubes shall be made of a tough abrasion resistant material to provide mechanical and environmental protection of the fibers, yet designed to permit safe intentional "scoring" and breakout, without damaging or degrading the internal fibers.

Buffer tube filling compound shall be a homogenous hydrocarbon-based gel with anti-oxidant additives and used to prevent water intrusion and migration. The filling compound shall be non-toxic and safe to exposed skin. The compound shall be chemically and mechanically compatible with all cable components, non-nutritive to fungus, non-hygroscopic, and electrically non-conductive. The filling compound shall be free from dirt and foreign matter and shall be readily removable with conventional nontoxic solvents.

Buffer tubes shall be stranded around a central member by a method that will prevent stress on the fibers when the cable jacket is placed under strain, such as the reverse oscillation stranding process.

209-1.5.4.11 Central Member. The central member, which functions as an anti-buckling element, shall be a glass reinforced plastic rod with similar expansion and contraction characteristics as the optical fibers and buffer tubes. A linear overcoat of low density polyethylene shall be applied to the central member to achieve the optimum diameter to provide the proper spacing between buffer tubes during stranding.

209-1.5.4.12 Filler Rods. Fillers shall be included in the cable, where needed, to lend symmetry to the cable cross-section. The sum of buffer tubes and filler rods shall be equal to six. Filler rods shall be solid medium or high density polyethylene. The diameter of filler rods shall be the same as the outer diameter of the buffer tubes.

209-1.5.4.14 Stranding. Completed buffer tubes shall be stranded around the overcoat central member using stranding methods, lay lengths, and positioning such that the cable shall meet mechanical, environmental, and performance specifications. A polyester binding shall be applied over the stranded buffer tubes to hold them in place. Binders shall be applied with sufficient tension to secure the buffer tubes to the central member without crushing the buffer tubes. The binders shall be non-hygroscopic, non-wicking (or rendered so by the flooding compound), and dielectric with low shrinkage.

209-1.5.4.15 Core and Cable Flooding. The cable core interstices shall be filled with a polyolefin-based flooding compound to prevent water ingress and migration. The flooding compound shall be homogeneous, non-hygroscopic, electrically non-conductive, and non-nutritive to fungus. The flooding compound shall also be nontoxic, safe, and compatible with all other cable components.

209-1.5.4.16 Tensile Strength Member. Tensile strength shall be provided by high tensile strength aramid yarns and fiberglass which shall be helically stranded evenly around the cable core.

209-1.5.4.17 Outer Jacket. The jacket shall be smooth, free of holes, splits, blisters, and other surface flaws, and shall be medium density cross-linked polyethylene (PE) with minimum nominal jacket thickness of 1.4 mm. Jacketing material shall be applied directly over the tensile strength members and flooding compound and shall not adhere to the aramid strength material. The polyethylene shall not promote the growth of fungus. The color of the cable outer jacket shall be solid yellow.

The jacket or sheath shall be marked with the manufacturer's name, the date of manufacture, a cable code to identify the number and type of fibers, and sequential measurement markings every meter. Additionally, the following shall be printed on the jacket at regular intervals:

209-1.5.5 Traffic Signal System Fiber Optic Cable. The actual length of the cable shall be within -0/+1 percent of the length marking. The color of the markings on the cable jacket shall be black. The height of the marking shall be approximately 2.5 mm.

The cable shall contain at least one ripcord under the sheath for easy sheath removal.

209-1.5.5.1 Fan-Out Termination. Individual fibers within the loose tube cable require handling protection inside the termination cabinets. Fan-out kits shall be installed in the patch panel enclosures to transition the loose tube fibers to ruggedized tight-buffered fiber pigtail cables. Fan-out tubes or furcation kits shall not be used. Optical fusion splices shall connect the loose tube fibers to the tight-buffered pigtail cables. The colors of the outer jackets of the tight-buffered pigtail cables shall match the colors of the individual fibers within the loose tubes. The optical splice loss shall comply with the specifications for optical splices. Splice protection sleeves shall be employed on all splices to protect the splices. A wall-mountable splice center shall house the splices and serve to fully protect excess lengths of loose tube fibers from exposure.

The tight-buffered pigtails shall be terminated with ST connectors.

209-1.5.5.2 Fan-out Pigtail Cable Specifications. Single-mode fiber (Corning SMF-28) shall be used in the pigtails. Optical characteristics shall comply with the optical fiber performance specifications.

Buffer material:	Thermoplastic
Buffer O.D.:	900 µm

Strength Member:	Kevlar
Jacket Material:	Polyethylene
Jacket O.D.:	2.5 mm
Temperature Range:	-20 °C to + 70 °C

209-1.5.5.3 Mechanical Performance.

- a) **Fiber Strippability.** The fiber optic jackets shall be easily removed with commercially available mechanical stripping tools. The cable shall contain at least one ripcord under the outer jacket layer to facilitate jacket removal.
- b) **Minimum Tensile Strength.** The fiber optic cable shall be rated to withstand a maximum tensile load of 2,700 N (608 pounds force) during installation (short term) with no damage and 890 N (200 pounds force) installed (long term). While these are rated tensile loads, the Contractor shall exercise every precaution in minimizing cable tension during installation.
- c) **Compressive Load.** The fiber optic cable shall withstand a compressive load of 220 N/cm applied uniformly over the length of the cable. The average increase in attenuation for the fibers shall be < 0.10 dB/km at 1550 nm for a cable subjected to this load, and the cable shall not exhibit any measurable increase in attenuation after load removal. Testing shall be in accordance with EIA-455-41, Compressive Loading Resistance of Fiber Optic Cable.
- d) **Tight-buffered Cables.** The fiber optic cable shall be of fiber optic sub-cables encased in an outer jacket. The cable shall contain 18 tight-buffered breakout-type riser-rated fiber optic sub-cables each comprised of one 9/125 μm (Corning SMF-28TM) single-mode (SM) fiber.

209-1.5.5.4 Fiber Optic Cable Description.

- a) **General Description.** Operating wavelengths shall be 1300 and 1550 nm for all fibers. A Polyethylene outer jacket shall be extruded under high pressure directly over the stranded fiber sub-cable core. This process results in the internal surface of the cable jacket interlocking with the cable substructure so that the cable cannot move axially within the cable jacket. The design shall allow the fully rated tensile load of the cable to be applied with wire mesh (Kellums-type) grips during installation. The cable shall be flame retardant UL-listed type ONFR for riser application.
- b) **Fiber Optic Sub-cables.** Each fiber sub-cable shall consist of a central glass optical fiber surrounded by a 500 μm primary UV-cured acrylate buffer with a secondary hard elastomeric polymer buffer up to 900 μm . Non-elastomeric (PVC) materials shall not be used for the buffer materials.
The tight-buffered fiber is surrounded by a synthetic yarn or aramid strength member (Kevlar or equal) and a color-coded elastomeric polymer jacket. Non-elastomeric (plastic) materials are not allowed. The strength member shall be composed of individually and precisely tensioned elements such that tensile loads are equally shared by each element. The sub-cable outside diameter shall be 2.5 mm.
- c) **Cable Outer Jacket.** The jacket shall be smooth, free of holes, splits, blisters, and other surface flaws, and shall be of flame-retardant Polyvinylchloride (PVC) with a nominal wall thickness of 1.0 mm and a minimum wall thickness of 0.75 mm at any point. The outer jacket shall be pressure extruded over the outer layer of the stranded cable core
- d) **Cable Marking.** The completed cables shall have sequentially numbered length markers, in a contrasting color to the cable jacket, at regular intervals of not more than one meter along the outside of the jacket. Printed on the jacket shall be the cable code to identify the number and type of fibers (for example: 18 Fiber - 18 x 9/125), the manufacturer's name, manufacturer's part number, the year of manufacture, and the sequential length markings. Additionally, the following shall be printed on the jacket at regular intervals.

209-1.5.6 Traffic Signal System Fiber Optic Cable. The actual length of the cable shall be within -0/+1% of the length marking. The marking shall be in a contrasting color to the cable jacket. The marking shall be 2.5 mm in height and must be permanent and weatherproof. The markings shall be repeated at one meter intervals.

209-1.5.6.1 Colors. The color of the cable outer jacket shall be solid yellow. The color of the markings on the cable jacket shall be black. The single-mode sub-cable outer jackets shall be color coded in accordance with EIA-598 and designated as shown below. The colors shall be targeted in accordance with the Munsell color shades. For all documentation, the individual sub-cables shall be identified by the fiber number.

209-1.5.6.2 Sub-cable Jacket Color Assignments for Fiber Type. Table 209-1.5.6.2(A) shall be used to apply the color of the sub-cable to the fiber type and sub-cable number.

Table 209-1.5.6.2(A)

Sub-Cable Number	Sub-Cable Color	Sub-Cable Number	Sub-Cable Color
1	Blue	10	Orange/Yellow Dash
2	Orange	11	Green/Yellow Dash
3	Green	12	Brown/Yellow Dash
4	Brown	13	Slate/Yellow Dash
5	Slate	14	White/Yellow Dash
6	White	15	Red/Yellow Dash
7	Red	16	Black/Yellow Dash
8	Black	17	Yellow/Black Dash
9	Blue/Yellow Dash	18	Violet/Yellow Dash

209-1.5.6.3 Mechanical Performance.

- a) **Fiber Strippability.** Both the primary and secondary fiber buffer layers, sub-cable jackets, and outer jacket shall be easily removed with commercially available mechanical stripping tools. The cable shall contain at least one ripcord under the outer jacket layer to facilitate jacket removal.
- b) **Minimum Tensile Strength.** The fiber optic cable shall be rated to withstand a maximum tensile load of 5000 N (1,124 pounds force) during installation (short term) with no damage and 2000 N (451 pounds force) installed (long term). While these are rated tensile loads, the Contractor shall exercise every precaution in minimizing cable tension during installation.
- c) **Residual Strain.** Optical measurements of fiber strain shall be made on two of the eighteen fiber sub-cables before, during, and after cable installations. To minimize stress corrosion and thereby insure optimum fiber lifetime performance, the measured optical fiber sub-cables shall not be allowed to exhibit more than 0.2 percent residual strain after installation. Under no conditions, during installation or other handling procedures, shall any portion of the cable structure be allowed to strain more than 0.75 percent.
- d) **Impact Resistance.** The cable shall withstand an impact of 500 times per the requirements of EIA-455-25.
- e) **Crush Resistance.** The fiber optic cable shall withstand a compressive load of 1000 N/cm applied uniformly over the length of the cable. The average increase in attenuation for the fibers shall be < 0.20 dB/km for a cable subjected to this load, and the cable shall not exhibit any measurable increase in attenuation after load removal. Testing shall be in accordance with EIA-455-41, Compressive Loading Resistance of Fiber Optic Cable.

The minimum crush resistance of the fiber optic cable shall be greater than 2000 N/cm without damage to the cable components or degradation of the optical performance.

The fiber optic cable shall be capable of withstanding 2,500 impacts, at 5 N-m force without damage to the fiber optic cable components or degradation of the optical performance. The impact resistance test shall be in accordance with EIA-455.

- f) **Cable Core.** All sub-cable elements shall be stranded together to maintain flexibility. Stiff central elements such as wire, tapes, separators, void fillers, or dielectric epoxy glass rods shall not be permitted.

209-2 CABLE INSTALLATION

209-2.1 Assistance and Technical Support. The Contractor shall seek the assistance and technical support of the supplier of the fiber optic cable in preparation for and during installation.

209-2.2 Cable Protection. The cable shall be inspected for jacket defects as it is removed from the reel. If defects are found, the pulling operation shall be terminated immediately and the Engineer notified. Repair of cable jacket will not be permitted. To reduce the possibility of damage to the outer jacket of the fiber optic cable, the following protective measures are recommended.

A cable feeder guide should be used between the cable reel and the face of the duct and conduit to protect the cable and guide it off the reel and into the duct. A pulling eye should be attached to the cable end and be used to pull the cable through the duct and conduit system. As the cable is pulled off the reel and into the cable feeder guide, it should be lubricated with a water-based lubricant approved by the cable manufacturer. Dynamometers or breakaway pulling swings should be used to ensure the pulling line tension does not exceed the installation tension values specified by the cable manufacturer. Maximum allowable cable strain during installation shall be 0.75 percent. The pulling of the cable should be hand assisted at each hand hole or pull box. The cable should not be crushed, kinked, or forced around a sharp corner.

209-2.3 Installation Procedures. Cables shall be installed in continuous lengths without intermediate splices throughout the project. Cable installation personnel shall be familiar with the cable manufacturer's recommended procedures including, but not limited to the following:

- a) Proper attachment to the cable strength elements for pulling during installation. Depending on cable design this will involve direct attachment to internal strength members or attaching an external "Kellums" or split mesh grip.
- b) Cable tensile limitations and tension monitoring procedures.
- c) Cable bending radius limitations.
- d) Cable twisting limitations.

The Contractor shall comply with the cable manufacturer's specifications at all times.

Cable installation procedures shall conform to Bellcore guidelines.

To accommodate long continuous installation lengths, bi-directional "center pull" techniques for pulling of the cable is acceptable and shall be implemented as follows:

- a) From the midpoint, pull the cable into the conduit from the shipping reel in accordance with the manufacturer's specifications.
- b) When this portion of the pull is complete, the remainder of the cable must be removed from the reel to make the inside end available for pulling in the opposite direction.

- c) This is accomplished by hand pulling the cable from the reel and laying into large "figure eight" loops on the ground. The purpose of the figure eight pattern is to avoid cable tangling and kinking. The loops shall be laid carefully one upon the other (to prevent subsequent tangling) and shall be in a protected area. The inside reel end of the cable is then available for installation.
- d) In some cases, it may be necessary to set up a winch at an intermediate cable vault. The required length of cable shall be pulled to that point, and brought out of the cable vault and coiled into a figure eight. The figure eight is then turned over to gain access to the free cable end. This can then be reinserted into the duct system for installation into the next section.

At locations noted on the plans the Contractor shall provide 9 m (30 feet) of cable slack. The cable shall be coiled and secured with cable ties. The Contractor shall ensure that the minimum bending radius of the cable is not compromised when preparing this stored cable slack.

The pulling eye/sheath termination hardware on the cables shall not be pulled over any sheave blocks.

When power equipment is used to install cabling, the pulling speed shall not exceed 30 meters per minute (100 feet per minute). The pulling tension, bending radius and twist limitation for cable shall not be exceeded under any circumstances.

Large diameter wheels, pulling sheaves, and cable guides shall be used to maintain the appropriate bending radius. Tension monitoring shall be accomplished using commercial dynamometers or load cell instruments.

Sufficient slack shall be left at each end of the cable to allow proper cable termination.

209-2.4 Optical Fiber Termination. Termination components shall meet or exceed the applicable provisions of EIA-455-5. Cables shall have all optical fibers terminated directly at the patch panel via connectors. All cables shall be routed in each equipment cabinet in a manner that prevents damage during regular operation and maintenance functions. All exposed cable and fiber sub-cables shall be secured every 300 mm (12 inches) to 500 mm (18 inches) to the equipment frame or cable tray with nylon ties, hand tighten only.

Connectors shall be field-installable and perfectly matched to the cable used. Optical fiber connectors shall satisfy all of the interface parameters of equipment components as may be defined by the transmission equipment specifications.

The connectors shall provide tight fitting termination to the cladding/buffer tubing and to the outer jacket. Epoxy-based or "hot melt" adhesives shall be used to bond the fiber and buffer to the connector ferrule and body prior to polishing the end face. No dry-termination or "quick crimp" connectors are allowed. When termination is authorized by the Engineer, termination shall be by trained, qualified persons only.

After termination with connectors, the fiber ends must be visually inspected at a magnification of not less than 100 power to check for cracks or pits in the end face of the fiber. If any irregularities found cannot be removed by further polishing, the entire process must be redone by cutting off and disposing the connector body.

Connectors shall have a maximum allowable connection loss of 0.3 dB per mated pair, as measured per EIA-455-34. No index-matching gel is to be used, dry interfaces only. Single-mode connectors

shall be capable of field installation on 9/125 μm fibers with 900 μm buffers (OD) and 2.5 mm outer jackets.

Each connector shall be of the industry standard SC™ type compatible, designed for single-mode tolerances, and shall meet or exceed the applicable provisions of EIA-455-5, 455-2A, and 455-34, and shall be capable of 100 repeated matings with a maximum loss increase of 0.1 dB. Connectors shall incorporate a key-way design and shall have a zirconia ceramic ferrule. Connector bodies and couplings shall be made of corrosion-resistant and oxidation-resistant materials, such as nickel plated zinc, designed to operate in humid environments without degradation of surface finishes.

Each connector shall be labeled for ease of subsequent identification and testing. Each connector label shall be attached next to the connector strain relief boot in a manner that will ensure that the label remains permanently intact. The optical test diagram details the numbering system to be used. The system employs two numbers, separated by a decimal point. The first number refers to the sub-cable number. The second number refers to the relative connector position in the backbone ring.

Splicing of fiber optic cable shall not be permitted **unless otherwise specified** in the Special Provisions or shown on the Plans. When splicing is authorized by the Engineer, splicing shall be by trained, qualified persons only. Any allowed splicing of fiber optic cable shall be by fusion splice only, no mechanical splices are permitted.

Fusion splicing equipment shall be in good working order, properly calibrated, and meeting all industry standards and safety regulations. Cable preparation, closure installation and splicing shall be accomplished in accordance with accepted and approved industry standards.

The average splice loss shall be 0.1 dB or less per splice. The average splice loss is defined as one-half the summation of the losses as measured in each direction using an OTDR through the fusion splice. No individual splice loss measured in a single direction shall exceed 0.15 dB.

Upon completion of the splicing operation, all waste material shall be deposited in suitable containers, removed from the Work Site, and disposed of in an environmentally acceptable manner.

209-2.5 Cable Testing. The Contractor shall notify the Engineer in writing 10 working days prior to commencing tests. The Contractor shall provide information regarding what type test equipment will be utilized (manufacturer and model number) plus the equipment calibration procedures that will be utilized.

209-2.6 Test Equipment. An Optical Time Domain Reflectometer (OTDR) with recording capability shall be utilized to test for the end-to-end transmission quality of each optical fiber. Quality tests shall consider both attenuation and localized loss discontinuities. The OTDR shall be equipped with a switchable, dual-wavelength module with 1300 nm and 1550 nm light sources compatible with single-mode test fibers. The OTDR shall be capable of writing to a floppy disk and configured with an X-Y plotter to provide a hard copy record of each test measurement. The OTDR shall be equipped with sufficient internal masking to allow the entire cable section to be tested. This may be achieved by using an optical fiber pigtail of sufficient length to display the required cable section, or by using an OTDR with sufficient normalization to display the required cable section. A hard copy X-Y plot shall be provided to the City for all OTDR tests. The OTDR shall be calibrated for correct index of refraction to provide proper length measurement from a known length of reference fiber.

Testing light source: A laser diode (LD) light source with a 1300 nm wavelength shall be used. The LD shall be stable within 0.1 dB in output power over a time period sufficiently long to perform the measurement.

Power Meter: The detector in the power meter shall have an effective numerical aperture (NA) and active area that is larger than the fiber under test. The power meter shall have a sufficient measurement range to measure the insertion loss of the cable and connectors in the link. The power meter must be linear over the range of losses to be measured in the system and have sufficient resolution for the proposed measurements (0.05 dB). The power meter must be able to measure both absolute power in units of dBm and relative loss in units of dB. The power meter must also be able to change its calibration wavelength to match the system operation wavelength (1300 nm).

Launch Reference Cable: The patchcord used to connect the fiber optic cable to the multiplexer shall be used as the launch reference cable for the particular link under test.

209-2.7 Submittals. Detailed drawings and specifications of proposed products shall be submitted. The contractor shall submit the manufacturing data, pre-shipment test results, and a sample. Representative samples manufactured to the above specifications shall be submitted.

The Contractor shall provide all documentation pertaining to the materials and method of execution proposed to satisfy the requirements of this section. The Engineer's approval is required prior to the committing of any materials or the commencement of any work.

Submittals required by this item shall include, but not be limited to, the following:

- a) A material staging plan, should the Contractor propose City-owned property as a staging area.
- b) Manufacturer's complete specifications for all communication system cables, connectors, patch panels, fiber optic multiplexers, video encoders, and associated electronics and hardware components.
- c) Manufacturer's complete specifications for optical fiber cable patch panels.
- d) A detailed fiber optic cable and twisted-pair cable installation procedure including the following:
 - i. Fiber optic cable cutting lengths reflecting the cable order and reel allocations.
 - ii. Detailed installation procedures (cable pulling plan) which shall contain the manpower and equipment to be used, locations of the manpower and equipment for each pull, location of figure eights, and the estimated pulling tensions and which also identify the physical locations for equipment placement, proposed equipment setup at each location, and the pulling methodology for each type of cable. The cable pulling plan shall be submitted for approval 10 working days prior to pulling in each fiber optic segment.
 - iii. Manpower proposed for all equipment, safety, and manual assist operations.

209-2.8 Test Documentation. The results of insertion loss testing shall be recorded along with the test date, test wavelength, name of person performing the test, and the brand name, model number and serial number of the equipment used during the test. The measurements shall be recorded on a form identical to the test table provided in this specification. OTDR traces shall be generated into a hard copy and software file on a floppy disk for the purpose of developing historical "as-built" documentation regarding the cable's condition before and after it was installed. The hard-copy and floppy disk documentation, along with associated software to reproduce on paper via personal computer, shall be provided to the Engineer.

209-2.9 OTDR Tests. The Contractor shall use OTDR testing to insure that each fiber is one continuous length (contains no splices within the cable structure) and meets the attenuation (dB/km) specifications of the manufacturer and cognizant industry standards. In addition, OTDR tests shall be performed to measure connector and fiber loss on all terminated fiber links. OTDR measurements shall be made before the cable installation to provide baseline data for comparison to post-installation OTDR tests.

209-2.10 Required OTDR Trace Information. Traces shall display the entire length of cable under test, highlighting any localized loss discontinuities (installation-induced losses, connector losses, or both). The trace shall display fiber length (in kilofeet), fiber loss (dB), and average fiber attenuation (in dB/km) as measured between two markers placed as near to the opposite ends of the fiber under test as is possible while still allowing an accurate reading. Care shall be taken to ensure that the markers are placed in the linear region of the trace: away from the front-end response and the far-end Fresnel reflection spike. Time averaging shall be used to improve the display signal-to-noise ratio. The pulse width of the OTDR shall be set to a sufficient width to provide adequate injected power to measure the entire length the fiber under test.

If connectors exist in the cable under test, then two traces shall be recorded. One trace shall record the fiber loss (dB) and average attenuation (dB/km) of the entire cable segment under test, including connectors. The second trace shall display a magnified view of the connector regions, revealing the connector losses (dB). Connector losses shall be measured using the Least Squares Approximation (LSA) or 5-point splice loss measurement technique.

The OTDR trace shall also include the following information:

- a) The date and time of the test
- b) The cable ID number
- c) The cable segment ID number
- d) The fiber color or sub-cable number
- e) Launch point connector number
- f) The optical wavelength used for the test
- g) The refractive index setting of the OTDR
- h) The pulse width setting of the OTDR
- i) The averaging interval of the test

209-2.11 Pre-installation OTDR. Prior to removal of each cable from the delivery reel, all optical fiber sub-cables within the cables shall be tested by the Contractor using an OTDR. The OTDR tests shall consist of end-to-end length and fiber attenuation (dB/km) measurements to ensure proper performance of the fiber optic cable. The tests shall be performed from both ends of each fiber to ensure complete fiber continuity within the cable structure. Cable sections failing this test shall be disqualified from subsequent use for installation.

Pre-installation, "on-reel" test results shall be compared with the manufacturer's test report delivered with the cable. Gross dissimilarities shall be noted and remedied between the contractor and manufacturer.

209-2.12 Post-Installation OTDR. The Contractor shall conduct insertion loss testing on all installed and terminated optical fiber elements. Insertion loss test measurements for each terminated fiber on each cable shall be documented by the Contractor and the results provided to the Engineer. Testing shall be conducted at 1300 nm for all terminated sub-cables. Total node-to-node insertion loss for each terminated sub-cable in each cable shall be within the fiber optic

multiplexer manufacturer's allowable loss budget specifications. The total node-to-node insertion loss, between adjacent multiplexers, for the single-mode fiber links shall be less than 6 dB at 1300 nm. If it is not, the Contractor shall take corrective measures to bring the insertion loss into compliance with the manufacturer's specifications, including re-mating and re-termination of the connectors, and/or replacement of the cable.

Fiber links shall be measured in both directions in order to measure patch panel connector and link insertion losses accurately. The Insertion Loss Test Table shall be used to conduct the insertion loss measurements. The table calls for inserting light at various insertion points and measuring power out at other points. Once all of the powers have been measured, the insertion losses are then calculated and recorded in the table.

209-2.13 (86-2.08E.1.3) Node Equipment.

209-2.13.1 Termination Cabinet. A Model 332 cabinet shall be installed at each location shown on the plans. The Contractor shall submit for review detailed drawings showing the proposed cabinet layout.

The cabinet shall be equipped with a standard ventilation fan and filter, shelves for shelf-mounted 404 modems, rack for mounting the fiber optic data network multiplexer and the fiber optic termination patch panel, 120 V AC power for operating equipment, and terminal blocks for copper cable termination.

209-2.13.2 Fiber Optic Termination Patch Panel. The patch panel enclosure shall be rack-mounted in the cabinet. The enclosure shall have nominal dimensions of 90 mm high x 480 mm wide x 375 mm deep (3.5 inches high x 19 inches wide x 15 inches deep). The enclosure shall have doors to protect the fiber terminations inside the panel. The inner connector panel shall be mounted vertically in the enclosure and be approximately in the center of the enclosure to allow access to both cable sides. The cable ends shall enter the patch panel enclosure from the bottom. The patch panel enclosure shall provide cable strain reliefs at the entry ports. All enclosure hardware shall be stainless steel or aluminum.

The fiber optic cable shall terminate inside each of the communications cabinets on a termination patch panel. The patch panel shall be fitted with "SCTM" type bayonet couplings. All optical fibers within the cable shall be terminated with "SCTM" compatible connectors. The patch panel shall have a 24-fiber capacity, and shall facilitate fiber optic cable cross-connection between outside plant cables and opto-electronic interface equipment. Unused couplings shall be fitted with protective dust covers. Factory-terminated, tight-buffered, aramid-reinforced fiber optic jumper assemblies or interconnect cables, standard 3.0 mm O.D., shall connect the optical fiber terminations to the multiplexer I/O ports via the patch panel couplings.

The termination patch panel shall be equipped with a suitable means for routing and securing of cables and shall provide a suitable means of protection for the mounted optical fiber connectors to prevent damage to optical fibers and connectors during all regular operation and maintenance functions. Bend diameters on cable, sub-cables, and jumpers must be greater than 100 mm (4 inches) at all times to ensure optical and mechanical integrity of the optical fibers.

209-2.13.3 Data Modems. Data modems for communicating with intersections shall be installed in the termination cabinets. Data Computer Equipment (DCE) EIA RS-232C interface shall be accomplished through a standard DB-9S (female) connector. The four wire modem-modem interface shall be provided by means of a color coded cable terminated with spade lugs. The maximum communicating distance shall be greater than 15 miles.

209-2.13.4 Copper Cable Termination Blocks. The Contractor shall provide and install 12-pair cable termination blocks in each cabinet where twisted-pair cable is installed. Termination blocks shall be capable of accepting #22 AWG insulated solid conductors and be rack mountable on a standard 480 mm (19") rack. Termination blocks shall be designed to operate in unheated outdoor cabinets, capable of resisting corrosion and oxidation, and capable of preventing open circuits caused by poor metal-to-metal contact.

Each quick connect terminal block and barrier terminal block shall be sprayed with a PIC restoration spray to retard corrosion. Three coats shall be applied prior to connecting the wires and three coats shall be applied after all the wire connectors have been completed. Each coat shall be allowed to dry thoroughly, as specified by the manufacturer, before the next coat is applied. Contractor shall terminate all SIC cable on termination blocks in each cabinet where twisted-pair cable is installed.

209-2.14 (86-2.08E.3) Twisted-Pair Copper Subsystems

The interconnect cable shall contain the amount of twisted, #22 AWG solid, copper pairs as specified in the Plans. This cable shall be constructed for installation in an underground conduit environment with a sheath consisting of a double coated aluminum shield over which a medium density polyethylene jacket is extruded, in accordance with REA Standard PE39. This cable shall be filled with a gel compound to resist water penetration and migration.

209-2.14.1 Cable Performance. The copper twisted-pair cable shall meet or exceed the following specifications:

1. 22 AWG, solid copper conductor, twisted pair
2. Insulation: Dual, semi-rigid PVC skin over foamed PE
3. Core wrap: Polypropylene film
4. Mutual capacitance of 94 nanofarads per mile, measured at 1 KHz
5. DC Resistance = 92 ohms per mile
6. Attenuation = 2.2 dB/1,000 ft. @ 150 KHz

209-2.14.2 Installation. The Contractor shall install cables and the combination connector/protector block. The same pair assignment shall be maintained. Cables shall be installed at each location per the Master Interconnect Conductor Assignments shown on the plans. Cables shall be installed in continuous lengths from terminal block to terminal block. There shall be no splicing between terminal blocks.

The Contractor shall determine a suitable cable installation method to ensure that all cable installation requirements shall be met in all conduit sections. All work shall be carried out in accordance and consistent with the highest standards of quality and craftsmanship in the communication industry with regard to the electrical and mechanical integrity of the connections; the finished appearance of the installation; as well as the accuracy and completeness of the documentation.

The Contractor shall make a physical survey of the project site for the purpose of establishing the exact cable routing and cutting lengths prior to the commencement of any work or committing any materials.

When ordering cable, the Contractor shall ensure that the cable shall be of sufficient length to pull from terminal block of one traffic signal controller cabinet to the terminal block of the next traffic signal controller cabinet. A minimum of 1 meter (3 feet) of cable shall be provided in each pull box.

The cable shall be carefully inspected for jacket defects as it is removed from the reel. If defects are noticed, the pulling operation shall be terminated immediately and the Engineer notified. Precautions shall be taken during installation to prevent the cable from being kinked or crushed. Crushed or kinked cable shall be replaced with new cable. As the cable is pulled into the conduit system, it shall be sufficiently lubricated with a lubricant that shall be the water based type and approved by the cable manufacturer. The mechanical stress placed upon the cable during installation shall not be such that the cable is twisted and stretched or exceeds manufacturer's specifications.

The pulling of the cable shall be hand assisted at each handhole or pullbox. When pulling through intermediate pullboxes, the cable shall be placed on the ground near the pullbox and care taken to prevent damage by vehicles or other objects. The cable shall not be crushed, kinked or forced around a sharp corner. A minimum of 1 meter (3 feet) slack shall be left in each pullbox and enough left at each end of the cable to allow proper cable termination. All cable pairs shall be terminated on terminal block.

209-2.14.3 Cable Testing. The Contractor shall perform field acceptance tests on the installed copper cable. The City shall observe the tests and the test results shall be documented as prescribed elsewhere in this specification. The Contractor shall replace any cable failing these tests at no additional expense to the City. The Contractor shall provide all test equipment necessary to perform the tests. All pairs of each copper cable shall be tested for continuity, polarity, shorts, grounds, longitudinal balance, and resistive loss consistent with the manufacturer's specifications and standard telecommunication industry requirements.

After installation each pair within the cable shall be tested with a Time Domain Reflectometer (TDR). TDR testing shall be for end-to-end transmission quality, splices, improper terminal termination, no bridge taps, or pairs that have no termination, open or shorted pairs. The Contractor shall certify that all individual wires have been terminated consistent with the wire insulation color to termination pin requirements.

The Contractor shall document the test results and provide a certification for each cable that the cable meets or exceeds the manufacturer's published specifications and otherwise complies with the requirements set forth in this specification. The Contractor shall provide the City with information regarding what type test equipment will be utilized (manufacturer and model number) plus the equipment calibration procedures that will be utilized by the Contractor prior to conducting all test routines.

Each underground cable shall be tested end-to-end from the termination block to the terminal block at each cabinet. The Contractor shall provide test readings for each of the following items to verify the cable performance:

- a) DC Resistance - The resistance of any conductor in any cable shall not exceed 92 ohms per mile.
- b) DC Resistance Unbalance - The resistance unbalance between the two conductors of any pair shall not exceed 5%.
- c) Mutual Capacitance - The mutual capacitance of any pair shall not exceed 94 nanofarads per mile at 1 KHz.
Capacitance Unbalance: Pair to Ground - The capacitance unbalance to ground at 1 KHz of any pair shall not exceed 800 picofarads per 1,000 feet.
- d) Ambient Noise Measurements - The Contractor shall measure the ambient noise level in dBm0 to determine the level of noise on each cable being tested. The distant end of the pair being tested should be terminated with a 600-ohm resistor. At the near end, a HP3551 or

equivalent transmission measuring set should be configured for conducting a noise reading test. Cable pairs being sampled shall provide an ambient noise figure of 30 dBm0 (-60 dBm) or better. The Contractor shall record all readings.

- e) Attenuation - The Contractor shall test the attenuation of all twisted pairs in each cable at various frequencies. Attenuation shall not exceed 2.2 db per 1,000 feet, measured at 150 KHz.
- f) Near-end Crosstalk - The near-end crosstalk (NEXT) coupling loss between worst pairs within a cable shall be equal to or less than 53 dB per 1,000 feet, measured at 150 KHz.
- g) Bit Error Rate - The contractor shall conduct a dynamic data transmission test of each pair in each cable whose application is intended for data communication applications. The dynamic test shall verify that the transmission quality of each cable shall support a bit error rate of 1×10^{-6} or better at 1 Mb/s. The results of this test shall be documented for one pair in each cable.
- h) Ground Resistance Measurements - Ground resistance of the single point ground system shall be measured before and after it is bonded to the electrical service ground or building earth ground. Resistance after the bond has been made to the electrical service ground (or building earth ground) should not exceed 3 ohms. If the measured ground resistance exceeds 3 ohms, the contractor shall provide additional grounding points until this maximum differential has been achieved.

TDR traces shall be generated into a hard copy and software file on a floppy disk for the purpose of developing historical "as-built" documentation regarding the cable's condition after it was installed. The hard-copy and floppy disk documentation shall be provided to the City.

209-2.15 (86-2.08F) Conductors. Conductors of size #8 AWG and larger shall be stranded. Ends of cables entering the controller shall be marked the same as in the pull boxes adjacent to the pole the cables serve and shall include the pole served. The cables shall be identified with one or more wraps of 13 mm (0.50-inch) 7 mil vinyl electrical tape, conforming to the following color coding:

A	B	C	D	E	F	G	H	I
Blue	Orange	Green	Brown	Grey	White	Red	Yellow	Violet

209-2.16 (86-2.09F) Wiring. Where specified on the plans or at the direction of the Engineer, conductors shall be spliced by the use of "C" shaped compression connectors as shown on ES-13. A jumper wire with clips shall be provided for continuity of shielded cables. The completed splice shall be rated for direct burial application and capable of normal continuous operation at 600 V. Splices shall be insulated with heat-shrink tubing of the appropriate size.

Splices shall be insulated by "Method B" or, at the Contractor's option, splices of conductors shall be insulated with heat-shrink tubing of the appropriate size after thoroughly painting the spliced conductors with electrical insulating coating.

The open end of cable jackets or tubing shall be sealed in a manner similar to the splicing requirements to prevent the entrance of water.

209-2.17 (86-2.095A) Fused Splice Connectors. A fused splice disconnect shall be installed in the pull box adjacent to the service point for a street light. Each street light shall have a fuse and fuseholder.

209-2.18 (86-2.11A) Service. Install Type III service equipment enclosure for combined 120 V metered traffic signals and 120 V unmetered street lighting as noted on the plans. Maximum base

size of service equipment enclosure shall not exceed 400 mm x 400 mm (16 inches x 16 inches) and service equipment shall meet all SDG&E requirements. Traffic signal service shall have 50 A, 1P, 120 V main circuit breaker, and street lighting service shall have 30 A, 1P, 120 V main circuit breaker, unless noted otherwise on the plans.

Continuous welding of exterior seams in service equipment enclosures is not required.

Type III service equipment enclosures shall be the aluminum type.

Circuit breakers shall be the cable-in/cable-out type, mounted on non-energized clips. All circuit breakers shall be mounted vertically with the up position of the handle being the "ON" position.

Dead front panel or panels, and corresponding exterior door, shall be hinged on one side and shall be openable without the use of tools.

A barrier-type terminal block rated for 40 A, minimum, shall be provided in each service equipment enclosure. The terminal block shall have a minimum of 12 positions with terminals rated at Size No. 8 or larger, to accept the field wires indicated on the plans. Field wires shall be terminated using crimped, insulated loop connectors.

209-2.19 (86-2.11A) Solar Electric Power System. Where shown on the plans, a solar electric power system shall be provided. The system shall consist of solar modules, batteries, a charge regulator, mounting hardware, and the necessary wiring.

209-2.19.1 Solar Electric Modules. Solar electric modules for school zone flashers shall use triple junction thin film technology. Twenty-four-hour systems may use the thin film or polycrystalline modules. Thin film module electrical characteristics shall be 16.5 V DC maximum power voltage and 23.8 V DC open circuit voltage under standard test conditions of 1000 W/m² at 25 °C. Polycrystalline module electrical characteristics shall be 16.9 V DC maximum and 21.5 V DC open circuit voltage under standard test conditions of 1000 W/m² at 25 °C. The cell shall be fabricated on a stainless steel back sheet. Cells shall include an integral bypass diode. Cells shall provide the required module wattage and be encapsulated under low-iron glass.

209-2.19.12 Batteries. Systems shall include between 1 and 4 sealed valve regulated lead-acid batteries depending on autonomy and load requirements. Battery size shall be group 27. Battery ratings shall be 12 V DC, 98–105 Amp-hours and the C/100 rate or similar. Plate chemical composition shall be of lead-calcium. The case and cover material shall be polypropylene. The terminal configuration shall be T881 designed for a 6 mm (1/4-inch) bolt. Batteries shall be filled with electrolyte suspended in a thixotropic gel or an absorbed glass mat which allows the battery to be placed upright or on its side. Batteries shall be designed for solar applications and shall come with a prorated warranty for such applications. A data sheet for the battery, showing lifetime versus cycle depth at 25 EC, shall be included.

209-2.19.13 Charge Regulator. The unit shall be an integrated system control unit with the capability to control power and load management functions. Basic features shall include charging of the system batteries based on voltage and temperature, low voltage disconnect to protect the batteries from over-discharge, and operation of the flasher circuit.

The unit shall have an external trigger input for system activation by external sources such as timers, detectors, and devices incorporating a switch/contact closure and shall include a select switch for this. The controller shall include a series switch-configured charge controller which controls the flow of array current to the battery.

The charging algorithm shall be a pulse type that features temperature-compensated charging. On-board short circuit protection shall be standard. The controller shall have two lamp outputs set for a 50 percent duty cycle each and normally calibrated for 50–60 flashes per minute to meet ITE and MUTCD standards.

Outputs shall be complimentary—one on and the other off. Automatic intensity adjustment of the lamps shall be made by the controller for variance in light conditions. Dimming circuitry shall be integral to the controller. Electronics shall be potted or coated to protect against environmental damage.

The unit shall feature an integral heat sink and an 8-position terminal strip with all positions labeled for ease of servicing. Manual switches shall be provided on the controller to select the lamp activation source (on continuous or external activation) and the dimming circuit activation. Dimming shall be capable of being defeated for school zone systems.

209-2.19.14 Mounting Hardware. Solar modules shall include an aluminum frame to allow for ease of mounting and rigidity. Solar modules shall be mounted to a fixed tilt mounting structure set to an angle of 45E–50E. The mount shall be constructed of galvanized steel (ASTM A-153 Class A) or clear anodized aluminum. The mount shall be suitable for use with a Type 1-A pole. The mount will include appropriate stainless steel hardware to secure the modules to the mounting structures.

The system shall be housed in a gasketed enclosure, constructed of 3 mm (0.125-inch) aluminum, and designed for mounting on a 4.2 m (14-foot) Type 1-A pole. The enclosure shall have room for a vertical aluminum mounting plate capable of holding the system controller and the timer module (school zone systems).

The battery section of the enclosure shall feature a minimum of 12 mm (½-inch) styrofoam insulation material around the battery compartment sides to minimize transfer of heat from the enclosure wall to the battery. Screen-covered louvered vents shall be included on each side of the enclosure to allow circulation of air in the enclosure.

The enclosure shall feature one or more PELCO police locks to secure the contents from unauthorized access. Enclosures shall be capable of holding either two or four batteries, depending on system requirements. The door shall have a lock cover plate attached to the door with a rivet. The door shall be attached to the main enclosure with hinges that are welded or sufficiently riveted to each piece. Enclosures for four batteries shall feature a continuous hinge. A mechanical stop shall be included to prevent the door from opening more than 115°.

209-2.19.5 Wiring. The system shall be provided complete with wiring necessary for installation on a Type 1-A pole. Cabinet and lamp wiring shall be color coded and include a seven-pin cannon plug in the harness to allow disconnect of the system. The plug shall be keyed with a locking mechanism to ensure proper connection. Array wiring shall be coated in UV resistant sheathing and come with cord grips for exiting the module and entry to the pole. Conductors shall be terminated with either a forked terminal or a spade terminal. Sealing lock rings or O-rings shall be used to minimize the entry of water or dust into the junction box. Module interconnect cables, if used, shall be constructed of #10 AWG with a UV resistant sheath. Cord grips shall be provided at entry and exit points to the module junction box. Conductors shall be terminated with forked terminals.

209-2.20(86-214D) Testing. Testing of control equipment and cabinet wiring, complete, will be accomplished at a facility by the City of San Diego. Testing of street lighting equipment will include a 3-day burn, by the Contractor, with the use of shorting caps.

209-2.21(86-2.16A) Painting. Where shown on the Plans or specified in the Special Provisions, all light standards, mast arms, luminaire arms, signal heads, luminaires, and electrical service cabinets shall be painted the specified color. In the Centre City Community, the specified color is known as CCDC dark blue (Sherwin Williams F63TXL-1075-4365, Tnemec 75-J6179, or equal).

Steel surfaces shall be prepared either by Power Tool Cleaning per Section 310.2.4, or Commercial Blast Cleaning conforming to 310-2.5.1(d), "General." New ungalvanized ferrous and non-ferrous metal surfaces shall to be prepared per section 310, "PAINTING." Coating system shall be Sherwin Williams (as listed below), Tnemec 75-J6179, or approved equal:

Wash Prime Coat: Sherwin Williams, Industrial Wash Primer, P60g2, 0.2-0.4 mil dry film thickness
 Prime Coat: Sherwin Williams Tile-Clad II Hi-Bild Primer, B62N 71/B60V 70, 4mils dry film thickness
 First Finish Coat: Specified color, or Sherwin Williams F63TXL-1075-4365, 2 mils dry film thickness
 Second Finish Coat: Specified color, or Sherwin Williams F63TXL-1075-4365, 2 mils dry film thickness

The Contractor shall touch up marred or abraded areas with a matching paint.

209-3 CONTROLLER ASSEMBLIES.

209-3.1 (86-3.01) Controller Assemblies. Traffic signal controllers shall conform with the latest edition of Standard Specifications, State of California, Department of Transportation," Section 86, and "Traffic Signal Control Equipment Specifications," State of California. Controller assemblies shall be on the current State of California Qualified Products List (QPL). Traffic Signal Control Equipment Specifications shall have precedence over Caltrans Standard Specifications.

209-3.1 (A) Controller Assembly

Model 332 Cabinet	Model 336 Cabinet	Model 337 Cabinet	Description
1	1	1	Model 170E controller unit* with Model 412C system memory module and Power Distribution Assembly #2 (PDA #2)
1	1	1	Aluminum cabinet wired for and including the necessary accessories for full operation except as noted
1	1	1	Model 210 monitor unit
4	2	2	Model 242 two-channel isolator
12	12	6	Model 200 switch pack
1	1	1	Model 27256 programming chip (blank)
1	1	1	Model 404 Modem w/harness
16	8	4	Model 222 two-channel loop detector sensor unit

*When specified, use Model 170E Master Controller Unit with C2 connector and C20 connector.

The doors of the cabinets shall be hinged so that the doors swing away from the curb or street.

When the controller assembly is to be furnished in a Model 336 cabinet with base adaptor, the cabinet shall be constructed in accordance with the Controller specification for Model 332 aluminum cabinet but with the configuration shown in Figure 3.

Front panel character display modules shall be socket mounted for easy replacement in the front panel assembly.

209-3.2 (86-3.06E) Model 200 Switch Packs. Model 200 switch packs shall be capable of operating Type "G" pedestrian signals without exceeding Model 210 conflict monitor threshold limits and shall be capable of switching a single L.E.D. head.

209-3.3 (86-3.06F) Model 412C System Memory Module. The module shall be designed so that persons inserting or removing the assembly shall not be required to insert hands or fingers within the controller unit housing this modular assembly. A handle or gripping device protruding no more than 31 mm (1¼ inches) from the front panel shall be attached to the front of the assembly. The front panel shall be connected to equipment ground. The front panel of the module shall be labeled "SYSTEM MEMORY MODULE MODEL 412C". Socket for 27256 EPROM chip shall be marked on the board adjacent to each socket designating the following descriptives: MS and LS.

209-3.4 (86-3.06G) School Zone Flashing Beacon System Timer Module. The system timer module shall have the following minimum standard features: (1) alphanumeric LCD display; (2) 48-hour capacitive backup; (3) 15 A SPDT relay output; (4) 16-key input keypad; (5) auto-leap year compensation; (6) auto-prompt for programming; (7) crystal clock source; (8) operating temperature range of -30E C to 74E C; (9) solid-state construction except for the relay; (10) auto-daylight savings time adjustment; and (11) compatible with nominal 12 V DC operation. The unit shall be capable of exception periods when operation can be suspended or optional programs can be run for periods such as holidays or special events. Program steps should allow the programming of a single day, weekend, or week days.

209-4 (Section 86-4) TRAFFIC SIGNAL FACES AND FITTINGS.

209-4.1 (86-4.01E) Signal Faces and Signal Heads. Signal head sections, except programmed visibility type heads, shall be metal with metal visors and metal back plates. Visors shall be tunnel-type, have ears and be attached to the signal heads with screws. Visors shall interchange with Econolite, Traffic Control Technologies, McCain, and Automatic Signal manufactured vehicle heads.

All new signal faces and all arrow indications shall be provided with 300 mm (12") sections unless shown otherwise on the plans. Lenses shall interchange with Econolite, Traffic Control Technologies, Automatic Signal, and McCain manufactured vehicle heads.

Type SV-1-T mountings with 5 sections and SV-2-TD mountings shall be strapped to the standard using 12 mm (½") stainless steel strapping material and a stainless steel standoff.

Except for programmed visibility heads, the red, yellow, and green indications shall be Type 1 Light Emitting Diode (LED) signal modules conforming to the latest Caltrans specifications. A maintenance period is not required. Replacement modules shall be provided promptly after receipt of modules that have failed at no cost to the City except cost of shipping of the failed modules. All warranty documentation shall be given to the Engineer prior to installation. The replacement modules shall be delivered to the City's Street Division-Electrical Section at Chollas Operations Station, 2781 Caminito Chollas, San Diego, CA 92105 within five working days after notification.

Where solar electric power is provided for a flashing beacon, the indication(s) shall be yellow or red Light Emitting Diode (LED) signal modules conforming to the latest Institute of Transportation Engineers specifications. A maintenance period is not required. Replacement modules shall be provided promptly after receipt of modules that have failed at no cost to the City except cost of shipping of the failed modules. All warranty documentation shall be given to the Engineer prior to

installation. The replacement modules shall be delivered to the City's Street Division/Electrical Section at Chollas Operations Station, 2781 Caminito Chollas, San Diego, CA 92105 within five working days after notification.

Traffic signal heads shall be green with black doors unless otherwise specified in the plans or specifications.

209-4.2 (86-4.05A) Programmed Visibility Vehicle Signal Faces. Lamps shall be furnished by the Contractor. The Contractor shall arrange to have a signal technician qualified to program the programmed visibility signal heads present at the time the signal heads are placed in operation. Lamps for the signal units shall be 150 W, 120 V, incandescent lamps with a minimum average rated life of 6,000 hours. The lamp and socket shall be the 3-prong type.

209-4.3 (86-4.06A) Types. Pedestrian signals shall be Type "G."

Each pedestrian signal shall consist of a housing with front screen, a message plate, and two Light Emitting Diode (LED) modules. Pedestrian signal housings shall be metal with metal visors and shall conform to provision in Section 86-4.01B. All pedestrian signals shall incorporate a pedestrian countdown timer indication.

The message plate shall be 1/8" nominal thickness ultra-violet-stabilized, prismatic-patterned polycarbonate plastic; 3/16" nominal thickness hammered wire glass; or 3/16" nominal thickness ultraviolet-stabilized, prismatic-patterned acrylic plastic. The message plates shall have a flat-black surface over the entire projected area except where the symbols are located. The material used to mask the message plate shall be hard and durable and shall bond in such a manner that it will not flake or peel when the message plate is in use or is washed. The symbols shall be the only illuminated portion of the message plate. The message plate shall be sealed to a polycarbonate case to form a dust-tight and weather-proof module.

For crossings where the distance from the near curb to the pedestrian signal indication is 18 m (60') or less, the luminance of the UPRaised HAND symbol shall be 960 cd/m² (280 footlamberts), minimum, and the luminance of the WALKING PERSON symbol shall be 3,400 cd/m² (990 footlamberts) minimum.

209-4.4 (86-4.05H) Audible Pedestrian Signals. Audible pedestrian signals shall be installed in conjunction with each visual pedestrian signal head where shown on the plans.

The audible pedestrian signal shall consist of a weather-proof audio signal device operating continuously during the protected walk interval of the corresponding visual pedestrian signal when actuated by the corresponding pedestrian push button. The output volume of the audio signal shall automatically adjust to the ambient noise level in the intersection. East-west crosswalks shall be designated by a "Beep-Beep" electronic bird chirping; north-south crosswalks by a "Cuckoo" electronic bird chirping.

Audible signal device speaker shall be mounted facing down in location shown on the attached, "Audible Pedestrian Signal Details."

209-4.5 (86-4.05I) Accessible Pedestrian Signals. Accessible pedestrian signal shall consists of an integrated push button assembly with vibrotactile button, programmable verbal message, locator tone with automatic volume adjustment to ambient noise.

209-4.6 (86-4.08A) Signal Mounting Assemblies. Signal faces installed prior to signal operation shall be covered with shade cloth, canvas, or similar. Cardboard is not an acceptable cover material. Mast arm slip-fitters, post top slip-fitters, and terminal compartments shall be cast bronze.

209-4.7 (86-4.09D) Flashing Beacons. Flashing beacons installed at school locations shall be equipped with a solid-state programmable timer with digital display as specified in Section 86-3.06G.

209-5 (Section 86-5) - DETECTORS

209-5.1 (86-5.01E) Vehicle Detectors. Loop wire shall be Type 1. Loop detector lead-in cable shall be Type "B". Slots shall be filled with elastomeric sealant, epoxy sealant, or hot-melt rubberized asphalt sealant, except asphaltic emulsion loop sealant and cold tar loop sealant are acceptable if the pavement surface will receive an asphaltic concrete overlay.

Vehicle detector loops shall be Type E or Type E Modified as shown on the plans. Bicycle detector loops within bicycle lanes shall be Type Q. For Type E detector loops, sides of the slot shall be vertical and the minimum radius of the slot entering and leaving the circular part of the loop shall be 40 mm (1½ inches). Slot width shall be a maximum of 20 mm (¾ inch). Type E detector loops shall have three turns of conductor. Limit line vehicle detector loops (front loops) shall be Type E Modified loops. Type E Modified loops shall have four turns of conductor.

The sand mixed with the epoxy loop sealant shall be clean and dry silica sand and shall be smaller than 1,520 µm (pass a No. 12 sieve) and be no smaller than 860 µm (retained on a No. 20 sieve). The adhesive shall be a black, low viscosity material consisting of equal parts of modified coal tar epoxy resin and modified amine-bitumen hardening agent, equal to Epocast H-1136A and 1136B. Adhesive shall be mixed together mechanically on the job site and shall have 30- to 45-minute pot life.

Fill the slot with sand. Soak the sand with adhesive overflow. Cover the slot with additional sand. Before the adhesive sets, strike off excess material flush with pavement and remove from adjacent road surfaces.

209-5.2 (86-5.01F) Preformed Inductive Loops. Preformed inductive loops shall be the type shown on the plans. The loop shall be 1.8 m (6 feet) square unless otherwise shown. The loop shall consist of 4 turns of No. 16, or larger, wire with Type THWN or TFFN insulation. The loop wires shall be encased in Size 10, minimum size, Schedule 40 or Schedule 80 PVC or polypropylene conduit. The conduit shall be sealed to prevent the entrance of water and the movement of wires within the conduit. The loop wires from the preformed loop to the adjacent pull box shall be twisted together into a pair (at least 7 turns per meter (2 turns per foot)) and encased in Schedule 40 or Schedule 80 PVC or polypropylene conduit between the preformed loop and the adjacent pull box or detector handhole. The lead-in conduit shall be sealed to prevent the entrance of water at the pull box or handhole end.

In new roadways, the preformed loops and lead-in conduits shall be placed in the base course, with top of conduit flush with top of base, and then covered with the asphalt concrete or PCC pavement. Preformed loops and lead-in conduits shall be protected from damage prior to and during pavement placement.

In new reinforced concrete structure decks the preformed loops shall be secured to the top of the uppermost layer of reinforcing steel using nylon wire ties. The loop shall be held parallel to the structure deck by using PVC or polypropylene spacers where necessary. Conduit for lead-in conductors shall be placed between the uppermost 2 layers of reinforcing steel.

In existing pavement, preformed loop installation shall conform to the following:

"The preformed loops and lead-in conduits shall be placed in slots, 6 mm (¼ inch) minimum width, cut into the existing pavement. The top of the conduit shall be 25 mm (1 inch), minimum, below the top of pavement."

Slots in asphalt concrete pavement shall be filled with elastomeric sealant, epoxy sealant, or hot-melt rubberized asphalt sealant.

Slots in portland cement concrete shall be filled with elastomeric sealant or hot-melt rubberized asphalt sealant, or shall be filled with epoxy sealant conforming to the requirements in Section 95-2.09, "Epoxy Sealant for Inductive Loops (State Specification 8040-31D-06)," of the Standard Specifications.

209-5.3 (86-5.02A) Pedestrian Push Button Assemblies. Pedestrian push buttons shall be Type "B." Actuator shall have a minimum diameter of 2 inches and an operating force of 2.5 to 3.6 N (9 to 13 ounces) and a release force of one N (3.5 ounces).

Pedestrian push button signs shall conform to the size shown on Standard Plan ES-5C. Signs shall display international "Walking Person" symbol and directional arrow. Pedestrian push button housing shall be mounted with the actuator button at 3 feet 3 inches □ 1 inch above the adjacent finished grade.

209-6 (Section 86-6) LIGHTING.

209-6.1 (86-6.02) Low Pressure Sodium Luminaires. Low pressure sodium luminaires shall be completely assembled, furnished with a lamp and ballast, and shall comply with the following requirements.

Luminaires shall be the enclosed type with a horizontal burning lamp. Luminaires shall be cutoff type or semi-cutoff type (Illuminating Engineering Society Classification) as shown on the plans. Luminaire performance data shall be performed and certified by an independent and recognized testing laboratory and shall be submitted with material lists in conformance with Section 86-1.04, "Equipment List and Drawings," of the Standard Specifications.

Lux distribution shall be ANSI Type III, short, or Type IV, medium distribution, for cutoff or semi-cutoff luminaires. With a 10.4 m (34-feet 3-inch) mounting height, each type of luminaire shall maintain a minimum of 2.1 lux (0.2 footcandles) at least 27.4 m (90 feet) each side, along the longitudinal roadway line below the luminaire, and a minimum of 3.75 lux (0.35 footcandles) at a transverse roadway distance from the luminaire location equal to 1.5 times the luminaire mounting height.

Certified luminaire performance data shall be furnished as part of the Equipment List and Drawings as specified in Section 86-1.03 of the Standard Specifications. This data shall include complete photometric test data in the form of isolux (isofootcandle) charts at a scale of 1:240 (1 inch = 20 feet), for the luminaire and lamp sizes indicated on the plans.

Alternate data may be in the form of horizontal lux (horizontal footcandle) values recorded on a 5 m x 5 m (15-foot x 15-foot) grid extending 27.4 m (90 feet) longitudinally each side of the light source, and 4.6 m (15 feet) behind and 27.4 m (90 feet) in front of the light source, for the luminaire and lamp sizes and the mounting height indicated on the plans. The horizontal lux (horizontal footcandle)

levels in the data submitted shall equal or exceed the levels specified in these special provisions. Failure to meet the referenced values will be justification for disapproval of the luminaires.

The photometric test shall be performed and certified by an independent and recognized testing laboratory. Subsequent to the Contractors installation of any luminaires, field checks may be performed at random by the Engineer and calculated according to the Illuminating Engineering Society "Guide for Photometric Measurement of Roadway Lighting Installation (LM-50-99)" (1999). Failure to meet or exceed the referenced values during field checks will be justification for replacement by the Contractor.

The luminaire shall be completely assembled and furnished with a lamp. Each luminaire shall consist of a housing, a reflector, a refractor or a lens, a lamp socket, an integral ballast, a removable ballast tray, a lamp support, a terminal strip, a capacitor, a slipfitter, and shall be provided with an integral standard three-prong twist lock receptacle for photoelectric cell control in accordance with latest EEL-NEMA standards. The reflector may be an integral part of the housing.

209-6.1.1 Construction. The luminaire housing shall be of corrosion-resistant die-cast aluminum, of 1.6 mm (0.0625-inch) corrosion-resistant aluminum sheet and plate with concealed continuous welds, or of acrylonitrile-butadiene-styrene sheet material (2.4 mm (3/32-inch), minimum nominal wall thickness) on a cast aluminum frame that provides mounting for all electrical components and the slipfitter. Positioning and clamping of the luminaire to the pipe tenon shall be accomplished by tightening mounting bolts. The housing shall be divided into optical and power compartments that are individually accessible for service and maintenance. A high temperature neoprene, or equal, sealing ring shall be installed in the pipe tenon opening to prevent entry of water and insects into the power and optical compartments. Access to the power unit shall be through a weather-tight hinged cover, secured with spring type latches or captive screws, to the luminaire housing. Hardware shall be stainless steel machine screws and/or bolts and shall be used to secure removable components. Sheet metal screws shall not be used.

The lamp socket shall be of high temperature, flame-retardant thermoset material with self-wiping contacts or may be of other equally durable material. The socket shall be rated for 660 W and 1000 V. Position of the lamp socket and the lamp support shall maintain the lamp in correct relationship with reflector and refractor for designed distribution pattern. Ballast shall be the autotransformer or high-reactance type and, when operated with the lamp, shall have the following characteristics and maintain the following lamp operation:

1. The power factor shall be not less than 90% when the ballast is operated at nominal line voltage.
2. Lamp wattage regulation spread, at any lamp voltage from nominal through life, shall not vary by more than $\pm 6\%$ for $\pm 10\%$ input voltage variation.
3. The lamp current crest factor shall not exceed 1.8 at nominal line voltage.
4. Ballast losses shall not exceed 24% for 180 W ballasts at nominal line voltage.

A single multi-circuit connector shall be provided for quick disconnection of ballast tray.

Field wires connected to the luminaire shall terminate on a barrier type terminal block secured to the housing. The terminal screw shall be captive and equipped with wire grips for conductors. The terminal block shall accommodate stranded or solid wire sizes No. 16 to No. 8.

The slipfitter shall be capable of attaching to a 70 mm (2 $\frac{3}{8}$ ") O.D. pipe tenon mounting bracket without the need for special mounting parts. Positioning and clamping of the luminaire to the pipe

tenon shall be accomplished by tightening mounting bolts. The slipfitter shall have minimum 5 degree tilt adjustment.

Semi-cutoff luminaires and molded refractor style (drop lens) cutoff luminaires shall be provided with a refractor. Refractors shall be one-piece injection molded polycarbonate 2.4 mm (3/32-inch) minimum thickness; or be made of a one-piece injection molded acrylic 3 mm (1/8") minimum thickness. The refractor assembly and flat lens assembly shall be constructed to rigidly maintain its shape. The refractor assembly and the flat lens assembly shall be hinged and secured with spring-type latch(es) to the luminaire housing.

Cutoff-type luminaires shall be provided with a flat lens. Flat lens shall be one piece polycarbonate of 2.4 mm (3/32"), minimum thickness. The flat lens shall be mounted in a metal frame. Alternate methods of manufacturing refractor may be approved provided minimum specified thicknesses are maintained. A sample refractor for testing will be required for alternate method of manufacturing.

The optical system, consisting of the reflector, refractor or flat lens, lamp socket, and lamp shall be in a sealed chamber. Sealing shall be provided by a gasket between the refractor or flat lens frame and the luminaire housing shall form a weather-tight, dust-tight enclosure.

209-6.1.2 Finish. Painted exterior surfaces of the luminaire shall be finished with a fused coating of electrostatically applied polyester powder paint or other approved ultraviolet inhibiting film. Color shall be aluminum gray unless otherwise shown.

209-6.2 (86-6.02A) Low Pressure Sodium Lamps. Lamps shall be single ended, bayonet base, tubular gas discharge lamps suitable for use in outdoor lighting application. The lamps shall have a 93% lamp lumen depreciation factor rating, and comply with the minimum performance requirements in Table 209-6.2(A).

Table 209-6.2(A)

Nominal Watts	Rated Lumens	Average Watts Over Life	Operating Position
18	1,800	18.6	Base up $\pm 110^\circ$
35	4,800	37.5	Base up $\pm 110^\circ$
55	8,000	58.9	Base up $\pm 100^\circ$
90	13,500	96.3	Horizontal $\pm 20^\circ$
135	22,500	139.1	Horizontal $\pm 20^\circ$
180	33,000	189.9	Horizontal $\pm 20^\circ$

Lamps are to have an average rated life of 18,000 hours (at 10 hrs/start) except the 18 watt size which shall be 14,000 hours. Lamps shall be able to reach 80 percent of light output within 10 minutes and shall restrike within 1 minute after an outage due to power interruption or voltage drop at the lamp socket.

The base of the lamp shall have a device that will allow the installer to indicate the month and year of installation.

209-6.3 (86-6.07C) Photoelectric Controls. The photoelectric control unit shall be Type "IV".

Photoelectric units for illuminated signs shall have a "turn-on" level of between 215 and 323 lux (20 and 30 footcandles) (corresponds to a switching level of approximately 430 to 646 lux (40 to 60

footcandles) measured in the horizontal plane). "Turn-off" level shall not exceed 3 times "turn-on" level.

209-7 (Section 86-7) - REMOVING, REINSTALLING, OR SALVAGING ELECTRICAL EQUIPMENT

209-7.1 (86-7.01) Removing Electrical Equipment. Salvaged equipment not reused on the job shall be delivered to the General Services Department, Street Division, Electrical Section at Chollas Operations Station, 2781 Caminito Chollas, San Diego, CA, and stockpiled. Delivery time and location shall be coordinated with the Senior Electrical Supervisor at Telephone No. (619)525-8650, a minimum of 1 Working Day in advance of desired delivery date. The Contractor shall provide equipment, as necessary, to safely unload and stockpile the material. The Contractor shall obtain an appropriate receipt upon delivery. The Contractor shall tag each pole and mast arm with the size and type using an indelible ink marker.

209-7.2 (86-7.02) Reinstalling Removed Electrical Equipment. When removed electrical equipment is to be reinstalled on a new or different size pole, the Contractor shall furnish and install all new mounting equipment including all necessary signal mounting assemblies, anchor bolts, nuts, washers and concrete as required for completing the installation.

209-8 (Section 86-9) - EMERGENCY VEHICLE PREEMPTION EQUIPMENT

209-8.1 (86-9.01) General. Each traffic signal, where shown on the plans, shall have a modulated light signal detection system which shall conform to the details shown on the plans and these special provisions. Each modulated light signal detection system shall consist of an optical detector/discriminator assembly or assemblies located at the traffic signal. Emitter assemblies are not required for this project.

Each system shall permit detection of two classes of authorized vehicles. Class I (mass transit) vehicles shall be capable of being detected at any range of up to 550 m (1,800') from the optical detector. Class II (emergency) vehicles shall be capable of being detected at any range up to 750 m (2,500') from the optical detector.

Class I signals (those emitted by Class I vehicles) shall be distinguished from Class II signals (those emitted by Class II vehicles) on the basis of the modulation frequency of the light from the respective emitter. The modulation frequency for Class I signal emitters shall be $9.63855 \text{ Hz} \pm 0.0014 \text{ Hz}$. The modulation frequency for Class II signal emitters shall be $14.03509 \text{ Hz} \pm 0.003 \text{ Hz}$.

A system shall establish a priority of Class II vehicle signals over Class I vehicle signals, and shall conform to the requirements in Section 25352, of the California Vehicle Code. Standard emitters for both classes of signals shall be available from the manufacturer of the system. Range measurements shall be taken with all range adjustments on the discriminator module set to "Maximum."

209-8.2 (86-9.02) Optical Detection/Discriminator Assembly. Optical detection/discriminator assembly shall conform to the following:

209-8.2.1 General. Each optical detection/discriminator assembly shall consist of one or more optical detectors, connecting cable(s), and discriminator module.

Each such assembly, when used with standard emitters, shall have a range of at least 550 m (1,800 feet) for Class I signals and 750 m (2,500 feet) for Class II signals. Standard emitters for both classes of signals shall be available from the manufacturer of the system. Range measurements shall be taken with all range adjustments on the discriminator module set to "maximum".

209-8.2.1.1 (86-9.02.1) Optical Detector. Each optical detector shall be a weatherproof unit capable of receiving optical energy from two separately aimable directions. The horizontal angle between the two directions shall be variable from 180° to 5°. The reception angle for each photocell assembly shall be a maximum of 8 degrees in all directions about the aiming axis of the assembly. Measurements of reception angle will be taken at a range of 550 m (1,800') for a Type I emitter and at a range of 750 m (2,500') for a Type II emitter. Each optical detector shall be installed, wired, and aimed as specified by the manufacturer. Mast-arm mounted optical detectors shall utilize clamping hardware shown in the attached, "E.V.P.E. Detector Mounting Details."

Internal circuitry shall be solid state, and electrical power shall be provided by the associated discriminator module. Each optical detector shall be contained in a housing, which shall include two rotatable photocell assemblies, an electronic assembly, and a base. The base shall have an opening to permit its mounting on a mast arm or a vertical pipe nipple, or suspension from a span wire. The mounting opening shall have female threads for Size 21 (¾") conduit. A cable entrance shall be provided which shall have male threads and gasketing to permit a water-proof cable connection. Each detector shall have mass of less than 1.1 kg (2 pounds) and shall present a maximum wind load area of 230 cm² (36 in²). The housing shall be provided with weep holes to permit drainage of condensed moisture.

209-8.2.1.2 (86-9.02.2) Cable. Optical detector cable shall meet the requirements of IPCEA-S-61-492/NEMA WC 5, Section 7.4, 600 volt control cable, 75 EC (165 °F), Type B, and the following:

- a) The cable shall contain 3 conductors, each of which shall be No. 20 (7 x 28) stranded, tinned copper with low-density polyethylene insulation. Minimum average insulation thickness shall be 0.63 mm (25 mil). Insulation of individual conductors shall be color-coded: 1-yellow, 1-blue, 1-orange.
- b) The shield shall be either tinned copper braid or aluminized polyester film with a nominal 20 percent overlap. Where the film is used, a No. 20 (7 x 28) stranded, tinned, bare drain wire shall be placed between the insulated conductors and the shield and in contact with the conductive surface of the shield.
- c) The jacket shall be black polyvinyl chloride with minimum ratings of 600 V and 80 EC (175 EF) and a minimum average thickness of 1.1 mm (45 mils). The jacket shall be marked as required by IPCEA/NEMA.
- d) The finished outside diameter of the cable shall not exceed 8.9 mm (0.35 inch).
- e) The capacitance, as measured between any conductor and the other conductors and the shield, shall not exceed 157 pf per meter (48 picofarads per foot) at 1,000 Hz.
- f) The cable run between each detector and the controller cabinet shall be continuous without splices or shall be spliced only as directed by the detector manufacturer. Provide 6 m (20 feet) of slack lead-in cable for each detector. Coil cable in pull box adjacent to pole on which detector is installed.

209-8.2.1.3 (86-9.02.3) Discriminator Module. Each discriminator module shall be designed to be compatible and usable with a Model 170 controller unit and to be mounted in the input file of a Model 332 or Model 336 controller cabinet, and shall conform to the requirements of Chapter I of the State of California, Department of Transportation, "Traffic Signal Control Equipment Specifications," dated April, 1978, and all addenda thereto, current at the time of project advertising.

Each discriminator module shall be capable of operating 2-4 channels, each of which shall provide an independent output for each separate unit. Each discriminator module, when used with its associated detectors, shall be capable of:

- a) Receiving Class I signals at a range of up to 300 m (1,000') and Class II signals at a range of up to 550 m (1,800').
- b) Decoding the signals, on the basis of frequency, at $9.639 \text{ Hz} \pm 0.119 \text{ Hz}$ for Class I signals and $14.035 \text{ Hz} \pm 0.255 \text{ Hz}$ for Class II signals.
- c) Establishing the validity of received signals on the basis of frequency and length of time received. A signal shall be considered valid only when received for more than 0.50 second. No combination of Class I signals shall be recognized as a Class II signal regardless of the number of signals being received, up to a minimum of ten signals. Once a valid signal has been recognized, its effect shall be held by the module in the event of temporary loss of the signal for a period adjustable from 4.5 seconds to 11 seconds in at least 2 steps at $5 \text{ seconds} \pm 0.5 \text{ second}$ and $10 \text{ seconds} \pm 0.5 \text{ seconds}$.
- d) Providing an output for each channel that will result in a "low" or grounded condition of the appropriate input of a Model 170 controller unit. For Class I signals, the output shall be a $6.25 \text{ Hz} \pm 0.1 \text{ percent}$, rectangular waveform with a 50 percent duty cycle. For Class II signals, the output shall be steady.

Each discriminator module shall receive electric power from the controller cabinet at either 24 V DC or 120 V AC.

Each channel, together with its associated detectors, shall draw not more than 100 mA at 24 V DC nor more than 100 mA at 120 V AC. Electric power, one detector input for each channel and one output for each channel, shall terminate at the printed circuit board edge connector pins listed below:

Table 209-8.2.1.3 (A) Board Edge Connector Pin Assignment

A	DC ground		
B	+24 V DC	P	(NC)
C	(NC)		
D	Detector input, Channel A	R	(NC)
E	+24 V DC to detectors	S	(NC)
F	Channel A output (C)	T	(NC)
		U	(NC)
H	Channel A output (E)	V	(NC)
J	Detector input, Channel B	W	Channel B Output (C)
K	DC Ground to detectors	X	Channel B Output (E)
L	Chassis ground	Y	(NC)
M	AC-	Z	(NC)
N	AC+		

(C) Collector, Slotted for Keying

(E) Emitter, Slotted for Keying

(NC) Not connected, cannot be used by manufacturer for any purpose.

Two auxiliary inputs for each channel shall enter each module through the front panel connector. Pin assignment for the connector shall be as follows:

- a) Auxiliary detector 1 input, Channel A

- b) Auxiliary detector 2 input, Channel A
- c) Auxiliary detector 1 input, Channel B
- d) Auxiliary detector 2 input, Channel B

Each channel output shall be an optically isolated NPN open collector transistor capable of sinking 50 mA at 30 V and shall be compatible with the Model 170 controller unit inputs.

Each discriminator module shall be provided with means of preventing transients received by the detector from affecting the Model 170 controller assembly.

Each discriminator module shall have a single connector board and shall occupy 1 slot width of the input file. The front panel of each module shall have a handle, to facilitate withdrawal, and the following controls and indicators for each channel:

- a) Three separate range adjustments each for both Class I and Class II signals.
- b) A 3-position, center-off, momentary contact switch, one position (down) labeled for test operation of Class I signals, and one position (up) labeled for test operation of Class II signals.
- c) A "signal" indication and a "call" indication each for Class I and for Class II signals. The "signal" indication denotes that a signal above the threshold level has been received. A "call" indication denotes that a steady, validly coded signal has been received. These two indications may be accomplished with a single indication lamp; "signal" being denoted by a flashing indication and "call" with a steady indication.

In addition, the front panel shall be provided with a single circular, bayonet-captured, multi-pin connector for two auxiliary detector inputs for each channel. Connector shall be a mechanical configuration equivalent to a MIL-C-26482 with 10-4 inserts arrangement, such as Burndy Trim Trio Bantamate Series, consisting of:

- a) Wall mounting receptacle, G0B10-4PNE with SM 20M-1S6 gold-plated pins.
- b) Plug, G6L10-4NE with SC20M-1S6 gold-plated sockets, cable clamp, and strainer relief that shall provide for a right-angle turn with 65 mm (2½") maximum from the front panel surface of the discriminator module.

209-8.2.1.4 Cabinet Wiring. The Model 332 cabinet has provisions for connections between the optical detectors, the discriminator module, and the Model 170 controller unit.

Wiring the Model 332 cabinet shall conform to the following:

- a) Slots 12 and 13 of input file "J" have each been wired to accept a 2-channel module.
- b) Field wiring for the primary detectors, except 24 V DC power, shall terminate on either terminal board TB-9 in the controller cabinet or on the rear of input file "J", depending on cabinet configuration. Where TB-9 is used, position assignments shall be as follows:

Position	Assignment
4	Channel A detector input, 1st module (Slot J-12)
5	Channel B detector input, 1st module (Slot J-12)
7	Channel A detector input, 2nd module (Slot J-13)
8	Channel B detector input, 2nd module (Slot J-13)

The 24 V DC cabinet power will be available at Position 1 of terminal board TB-1 in the controller cabinet.

Field wiring for the auxiliary detectors shall terminate on terminal board TB-0 in the controller cabinet. Position assignments are as follows:

FOR MODULE 1 (J-12)		FOR MODULE 2 (J-13)	
Position	Assignment	Position	Assignment
1	+24 V DC from (J-12E)	7	+24 V DC from (J-13E)
2	Detector ground From (J-12K)	8	Detector ground from (J-13K)
3	Channel A auxiliary detector input 1	9	Channel A auxiliary detector input 1
4	Channel A auxiliary detector input 2	10	Channel A auxiliary detector input 2
5	Channel B auxiliary detector input 1	11	Channel B auxiliary detector input 1
6	Channel B auxiliary detector input 2	12	Channel B auxiliary detector input 2

209-8.2.1.5 System Operation. The Contractor shall demonstrate that all of the components of each system are compatible and will perform satisfactorily as a system.

209-9 (Section 86-10) - RELATED CONSTRUCTION

209-9.1 (86-10.01) Pedestrian Barricade. Pedestrian barricades shall be constructed in accordance with attached City of San Diego Standard Drawing SDE-103 (Modified). Assembly shall be commercial quality galvanized material.

209-9.2 (86-10.02) Traffic Signs and Components. Traffic signing shall conform to latest version of the California Manual on Uniform Traffic Control Devices (CA MUTCD). Sign panels shall be 2 mm (0.080") aluminum alloy 5052 mill-produced stable H38 hardness. All aluminum shall be anodized. The sheeting on the signs shall be 3M™ Scotchlite™ High Intensity Grade Reflective Sheeting Series 2870/3870, Stimsonite Series 6200, or equal.

209-9.3 (86-10.03) Traffic Striping and Marking Removal. Removal of traffic striping and marking shall conform to Section 15, "Existing Highway Facilities."

The Contractor shall neatly and thoroughly remove all striping and marking from pavement surfaces at those locations shown. Removal shall be by wet sandblast cleaning method. The Contractor shall furnish all materials, labor, tools, equipment and incidentals as required for completing the removal of traffic striping and marking. Abrasive used for sandblast cleaning shall be either clean dry sand or mineral grit, at the option of the Contractor, and shall be of a grading suitable to produce satisfactory results. The use of abrasives other than those specified herein will not be permitted unless approved, in writing, by the Engineer. Grinding of thermoplastic marking material or paint or tape will be permitted.

When sandblast cleaning is being performed in areas adjacent to traffic, people, or property, the Contractor shall provide suitable devices and take appropriate actions to prevent damage or injury. Prior to starting work, the Contractor shall furnish for approval of the Engineer, a description of all equipment which is to be utilized in the performance of the work. Traffic striping and marking shall be removed regardless of the condition and thickness of the paint, per measurements made by the Engineer prior to removal. Pavement legends shall be removed by grinding or sandblasting a rectangular-bounded area. The pavement shall be restored by slurry seal or asphaltic concrete patch.

209-9.4 (86-10.04) Traffic Striping and Pavement Markings. Traffic striping and pavement markings shall conform to Section 84, and to the Standard Plans, State of California, Drawing No. A20A, B, C and D; and to A24A, B, C, D, and E.

The paint shall be rapid dry water-borne (State Spec. No. 8010-91D-30). Pedestrian crosswalks, limit lines, pavement arrows, and pavement legends (except within a bike lane) shall be installed utilizing thermoplastic marking material.

209-9.5 (86-10.05) Raised Reflective Pavement Markers. Raised Reflective pavement markers shall conform to Section 85 of the California Standard Specifications.

Pavement markers shall be installed where indicated on the plans on all lane lines and centerline striping on all new streets, as well as on existing streets where replacement of pavement markers is necessary. The minimum height of the pavement markers shall be 18 mm (0.70").

SECTION 210 – PAINT AND PROTECTIVE COATINGS

210-1.6.1 General: ADD the following:

Additional requirements for paint for traffic striping and marking have been incorporated as an **Appendix**.

SECTION 211 – SOILS AND AGGREGATE TESTS

211-1.1 Laboratory Maximum Density. REVISE section with respect to the methods used to read as follows:

Compaction tests will be performed in accordance with ASTM D 1557, or Calif. Test Method No. 216.

211-1.2 Field Density. DELETE in its entirety and SUBSTITUTE with the following:

Field density of soil shall be by ASTM Methods D 1556 (Sand Cone), D 2922 (Nuclear Gauge), or California Test Methods 216 (Sand Cone) or 231 (Nuclear Gauge).

SECTION 212 – LANDSCAPE AND IRRIGATION MATERIALS

212-1.1.2 Class "A" Topsoil. Second paragraph, first sentence, DELETE in its entirety and SUBSTITUTE with the following:

The Contractor shall provide the source and location of soil and test results by a third party independent laboratory reflecting compliance with Contract Documents to the Engineer within 14 days of the NTP.

A second series of independent third party soil tests shall be required 15 days before soil placement to verify conformance with these specifications.

A third series of tests by a third party independent laboratory will be required after soil placement to verify conformance with this section. No planting shall begin until test results confirm the agricultural suitability of the topsoil.

Third party independent laboratory tests shall be paid for by the Contractor.

Second paragraph, third sentence CHANGE "1-inch (25 mm)" to read "1/2-inch (12.5 mm)."

Third paragraph; REVISE subsection (3) to read as follows:

3) Agricultural Suitability

The topsoil shall be suitable to sustain the growth of the plants specified and shall conform to the following requirements:

- a) pH - 6.0 minimum to 7.5 maximum
- b) EC (electrical conductivity) – 3.0 maximum
- c) Organic Content (20-25% by Volume)

The test results shall show the following information:

- a) Date of Testing
- b) Project Name
- c) The Contractor's Name
- d) Source of Materials and Supplier's Name
- e) Estimate of Quantity Needed
- f) Soil Gradation
- g) Soil Permeability
- h) Toxic Elements
- i) pH
- j) EC
- k) Organic Content
- l) Recommendations for adding amendments, chemical corrections, or both.

Topsoil which requires amending to comply with these specifications shall be uniformly blended. Once blended, the Contractor shall provide the Engineer with documentation showing the stockpile location and the quantity prepared of the amended topsoil reserved for the Project. Third party independent laboratory test results reflecting compliance with above requirements shall be provided to the Engineer prior to the release of the topsoil.

212-1.1.3 Class "B" Topsoil. ADD the following:

Topsoil shall be weed free upon delivery or treated as specified for weed eradication.

212-1.1.4 Class "C" Topsoil. ADD the following:

The soils shall be tested for agricultural suitability in accordance with 212-1.1.2, "Class "A" Topsoil." The soils shall be amended in accordance with the recommendations included in the test results and as approved by the Engineer.

212-1.2.1 General. Second paragraph; DELETE the words "when required by the Engineer."

212-1.2.3 Commercial Fertilizers. ADD the following:

Fertilizers shall be compressed slow release tablets (20-10-5) in 5 and 21 gram sizes as follows:

Quantity	Weight	Application
One Tablet	5 grams	Per Each Flatted Plant or Cutting
One Tablet	21 grams	1-Gallon Container
Two Tablets	21 grams	5-Gallon Container
Four Tablets	21 grams	15-Gallon Container
One Tablet	21 grams	Per Each 2" of Box Sized Container

212-1.2.5 Mulch. ADD the following:

Mulch materials shall be free of seed, debris, and deleterious materials as certified by the Supplier.

Fifth and sixth paragraphs, REVISE to read as follows:

- e) "Type 5 Mulch (fir or redwood bark chips), shall be fir or redwood bark chips in the gradation specified."

ADD the following paragraphs:

- g) Type 7 Mulch (wood chips), shall be wood chips in the size and type specified.
- h) Type 8 Mulch (rock or gravel) shall be rock or gravel in the size specified.
- i) Type 9 Mulch (shredded redwood or cedar bark), shall be either redwood or incense cedar bark, which knits in a manner to minimize sloughing, floating or being kicked away.
- j) Type 10 Mulch (recycled)
 - mulch (2" minus in size)
 - mulch (4" minus in size)

Type 10 Mulch shall be recycled, clean green material processed in accordance with California Code of Regulations, Title 14, Chapter 3, Article 7, § 17868.3. Clean green material shall be tree and landscape materials that have never been mixed with other waste materials, and have been processed by a permitted compost facility.

ADD: 212-1.2.6 Inorganic Soil Amendments.

Iron Sulfate. Iron sulfate shall be ferric or ferrous sulfate in pelleted or granular forms containing not less than 18% metallic iron.

Gypsum. Gypsum shall be commercially processed and packaged. $\text{CaSO}_4 - 2\text{H}_2\text{O}$ shall contain 14% minimum combined sulfur.

212-1.3 Seed. ADD the following:

Seed, which has become wet, moldy or otherwise, damaged in transit or storage, or arrives to the jobsite unlabeled, will not be accepted. Seed shall be certified to conform to the specified purity and germination by the seed Supplier. Seed tags shall be retained by the Contractor and submitted to the Engineer prior to the seeding operation.

Custom seed blends shall have the Project name printed on the seed tag. Custom seed blends shall be inspected and approved by the Engineer once delivered to the jobsite, prior to the start of any seeding operation.

Seed containers shall be sealed at the seed producers, clearly labeled with the contents and production date.

212-1.4.1 General. First paragraph, REVISE the first sentence to read as follows:

Plants shall be inspected and approved by the Engineer prior to planting.

212-1.4.2 Trees. ADD the following:

Trees shall have a uniform trunk taper from the base of the tree, continuing up the main leader. Palms shall be unskinned unless specified otherwise.

212-1.4.4 Flatted Plants. CHANGE the words "flats" to "flat".

212-1.4.5 Sod and Stolons (turf grass). ADD the following:

Sod and Stolons species shall be as specified on the Plans or in the Special Provisions. Material shall be delivered and installed within 24 hours of harvesting with shipping documentation to verify the origin, harvest date, Stolon preparation date, and shipment date.

212-1.5.3 Tree Stakes. ADD the following:

Tie material shall have minimum tensile strength of 500 pounds. Tree Stakes treated with Chromated Copper Arsenate (CCA) shall not be used.

Last sentence, DELETE in its entirety and SUBSTITUTE with the following:

Covers for wire shall be white PVC pipe, 1/2 inch (13 mm) minimum diameter and 6' (1.8 meters) minimum length.

ADD: 212-1.6 Jute. Jute matting shall be of open weave, with approximately 1" square mesh. It shall be manufactured from loosely twisted jute yarn varying in thickness no more than half its normal diameter.

Matting shall be made smolder resistant by treatment with chemicals, which are non-leaching and non-toxic. An identification mark to differentiate it from untreated jute cloth shall be present.

ADD: 212-1.7 Excelsior. Excelsior blanket shall consist of a cured wood excelsior mat. Fibers shall be evenly distributed over the entire area of matting; 80% shall be at least 6" (150 mm) long with consistent thickness. The topside of the matting shall be covered with 2"x1" (50 mm x 25 mm) biodegradable extruded plastic mesh. The blanket shall be made smolder resistant without chemical additives.

ADD: 212-1.8 Staples. Staples for erosion control matting shall be 11-gage steel wire, bent in a "U" shape with 6" (150 mm) minimum length embedded into the soil.

ADD: 212-1.9 Root Barriers. Root barriers shall be equivalent to type LB 12-2 or UB 18-2 for installations at existing trees and UB 24-2 for installations at new construction, as manufactured by DeepRoot, 19.5" and 24" root control fabric as manufactured by Biobarrier, or approved equal.

212-2.1.3 Plastic Pipe for Use with Solvent Weld Socket or Threaded Fittings. Second and third paragraphs, REVISE to read as follows:

Schedule 40 or Class 315 pipe shall be used for continuously pressurized pipe on the supply side of control valves as shown on the Plans. When threaded joints are used, only Schedule 80 pipe shall be supplied for continuously pressurized pipe on the supply side of control valves and Schedule 40 or Schedule 80 for the non-pressurized pipe.

Fittings and couplings for plastic pipe shall be threaded or slip-fitted tapered socket solvent weld type. Threaded female adapters shall be provided with socket pipe for connections to threaded pipe. Plastic pipefitting and coupling shall be PVC I or PVC I/II material. The type of plastic material and schedule size shall be indicated on each fitting or coupling. Fittings and couplings shall comply with the following specifications:

SOCKET FITTING

Schedule 40 ASTM D2466

Schedule 80 ASTM D2467

THREADED FITTINGS

Schedule 40 ASTM D2466

Schedule 80 ASTM D2464

ADD: 212-2.1.3.1. Pipe Primer and Glue. See 207-17.3.3, "Solvent Cement Joints."

ADD: 212-2.1.3.2. Pipe Sleeves. Pipe sleeves shall be Schedule 40 pipe, 2 times the diameter of the pipe or wire bundle being sleeved. Sleeve shall extend 12" beyond edge of pavement and terminate in pull boxes where pipe sleeves cross streets and driveways.

ADD: 212-2.1.6 Concrete Thrust Blocks. See 201-1.1.2, "Concrete Specified by Class and Alternate Class."

212-2.2.3 Manual Control Valves. REVISE the title to read:

212-2.2.3 Manual Control Globe Valves.

212-2.2.4 Remote Control Valves. ADD the following:

Plastic remote control valves may be used only when specified or with prior approval from the Engineer. Plastic remote control valves shall be electrically operated. Unless otherwise specified, the valve body shall be constructed of heavy-duty glass-filled UV-resistant nylon and have stainless steel studs and flange nuts; diaphragm shall be of nylon reinforced nitrile rubber, with accurately machined valve seat surfaces, equipped with flow control adjustment and capability for manual operation. The valve construction shall be such as to provide for all internal parts to be removable from the top of the valve without disturbing the valve installation.

212-2.2.6 Quick Coupling Valves and Assemblies. REVISE the size to 1".

ADD the following:

Quick coupling valves shall have a locking rubber cap.

212-2.2.7 Valve Boxes. ADD the following:

Covers shall be cast iron with non-corrosive metal self locking device, connected with stainless steel bolts and self locking nut, and permanently and legibly labeled with 100% acrylic epoxy white or yellow water proof paint on the top of the box indicating the component contained in the box.

Weatherproof plastic identification tags showing the irrigation controller and station shall be affixed to the colored conductor wire in each valve and pull box.

ADD: 212-2.2.8 Master Control Valve. The master control valve shall be normally open design of solid brass construction with a water-proof 24 VAC 3-way solenoid coil, self-cleaning orifice and one-piece molded construction diaphragm with integral O-ring seal reinforced with 600 lb. test fabric. The valve shall be slow closing to prevent water hammer and surge and shall operate on pressure up to 200 psi for ¾" through 2" valve sizes and 150 psi for 2 ½" and 3" valve sizes.

ADD: 212-2.2.9 Flow Sensing Device. The flow sensing device shall be an in-line type with a non-magnetic, spinning impeller as the only moving part. The electronics housing shall be glass-filled. The impeller shall be glass-filled nylon or Tefzel with a UHMWPE or Tefzel sleeve bearing. The shaft material shall be tungsten carbide. The electronics housing shall have two ethylene-propylene O-rings and shall be easily removed from the meter body.

The sensor electronics shall be potted in an epoxy compound designed for prolonged immersion. Electrical connections shall be 2 single conductor 18AWG leads. Insulation shall be direct burial "UF" type colored red for positive lead and black for the negative lead. The flow sensing device shall operate in line pressures up to 100psi and operate in flows of 1 foot per second to 20 feet per second with linearity of plus or minus 1% and repeatability of plus or minus 1%. The meter body shall be fabricated from Schedule 80 PVC tees with socket end connections.

ADD: 212-2.2.10 Rain Sensing Device. The rain sensing device shall be constructed of high impact thermoplastic which can withstand extreme weather conditions. The enclosure shall be stainless steel and vandal resistant as shown in the Contract Documents. It shall contain hygroscopic discs which absorb water and expand proportionally to the amount of rain collected. The rain sensing device shall be connected to the controller and shall operate by interrupting the electrical circuit from the irrigation controller to the irrigation remote control valves and restoring the electrical circuit upon sufficient drying of the hygroscopic discs.

ADD: 212-2.2.11 Locking Valve Cap. The locking valve cap shall be Molded high-impact plastic body with locking brass hinged covers that allows welding to 2" PVC pipe as manufactured by Weathermatic or equal.

ADD: 212-2.2.12 Pressure Regulating Valve. The pressure regulating valve shall consist of a bronze body and bell housing, a separate access cover for the plunger and a bolt to adjust the downstream pressure. The bronze bell housing and access cap shall be threaded to the body and shall not require the use of screws. The assembly shall be of the balanced piston design and shall reduce pressure in both flow and no-flow conditions. The assembly shall be accessible for maintenance without having to remove the body from the water line.

ADD: 212-2.2.13 Wye Strainer. The Wye Strainer shall be cast bronze per ASTM B584. The strainer screen shall be 20 mesh 300 series stainless steel and shall be accessible for cleaning without removing the device from the water line.

ADD: 212-2.2.14 Backflow Preventer Enclosure. The backflow preventer enclosure frame shall be constructed of 1½" tubular stainless steel with formed stainless steel tubing and rod or ½" - #13 flattened mesh expanded stainless steel cage. The enclosure shall be smooth with no sharp edges or burrs. The enclosure shall be equipped with stainless steel mounting hardware and locking mechanism capable of being embedded into a concrete pad. The enclosure shall be of sufficient size to contain the backflow preventer and any ancillary equipment such that the inlet and outlet pipes shall be fully within the enclosure.

ADD: 212-2.2.15 Anti-Drain Check Valve. Anti drain check valves shall be capable to compensate for elevation changes up to 32' and shall meet Schedule 80 pipe specifications. The anti-drain check valves shall be capable of being adjusted through the top of the valve.

Anti drain check valves shall be installed within the swing joint below the irrigation head unless the irrigation head specified has an integral anti drain check valve or Site conditions e.g., being installed on a fixed riser warrant additional protection as determined by the Engineer.

ADD: 212-2.2.16 Booster Pump. Water pressure booster pump system shall be designed and fabricated by Barrett Engineered Pumps or approved equal. The system shall be a completely prefabricated system with pump, piping, electrical and structural elements fully contained within a marine grade aluminum alloy enclosure with a hinged top. The enclosure shall be secured to the concrete pad with stainless steel hardware.

- a) Pump shall be single stage end suction close coupled centrifugal, cast iron bronze fitted construction, equipped with mechanical shaft seal, back pullout design. Impeller shall either be keyed or locked to the shaft with a hex head impeller nut and washer or shall be threaded directly to the end of the shaft. Pump shaft shall either be high strength S.A.E. 1045 carbon steel protected in the stuffing box area by a replaceable bronze shaft sleeve or shall be stainless steel with no sleeve. Pump shall be directly coupled to a C-face electric motor.

- b) Electric motor shall be of the squirrel cage induction type suitable for full voltage starting. Motor shall be ODP to aid in cooling. Electric motor shall be rated for continuous service. The motor bearings shall be of such size that the average life rating is no less than three (3) years (10,000 hours) of B10 life. The motor shall have horsepower ratings such that the motor will carry the maximum possible load to be developed under the designed pumping conditions and not overload the motor beyond the nameplate rating of the motor. Motor shall have a 1.15 service factor. The motor shall conform to the latest NEMA Standards for motor design and construction.
- c) Pump Control Panel shall have a NEMA 4X plain front non-metallic enclosure with padlock latches. Includes power and control resettable thermal circuit breakers, heavy duty magnetic starter with adjustable overload protection, Hand-Off-Auto switch to select mode of operation, and heavy duty numbered terminal strips for power and control wiring lead terminations.
- d) Metal oxide varistor protected pump start relay(s) incorporated in panel to start pump with signal from each irrigation controller.
- e) All system piping shall be type "L" copper. All fittings shall be copper or brass, with unions or flanges to allow for system disassembly or major component removal. System shall incorporate an integral full pipe size bypass line with check valve to allow for pump removal and repair without disrupting water supply to system.
- f) Isolation valves shall be all brass quarter turn ball valves with hard chrome ball on lines 2" and less. Isolation valves shall be lug style butterfly valves with Buna-N elastomeric seats, ductile iron nickel coated disc, and stainless steel stem with handle and 10 position galvanized memory plate on lines 2½" and greater.
- g) Check valves shall be all brass spring loaded disc style with metal-backed Teflon wafer disc, stainless steel stem and spring on lines 2" and less. Check valves shall be cast iron bronze fitted wafer style silent check with spring loaded bronze disc, bronze guide shaft, stainless steel spring and replaceable bronze seat on lines 2½" and greater.
- h) Gauges shall be 2½" diameter face, glycerin filled with stainless casing and brass internals. Gauges shall be equipped with brass isolation petcocks.
- i) Flow activated paddle style magnetically coupled flow switch, sensitive to flows as low as 1 fps, mounted on piping and interconnected to time delay relay to shut down pump on no-flow conditions, time delay relay adjustable from 0 to 5 minutes.
- j) Pump system shall be mounted on a structural aluminum skid with mounting flanges on front and back to allow for mounting of skid to concrete pad. Skid equipped with pipe support on suction and discharge piping. All nuts and bolts and washers, to be heavy zinc coated steel, on skid and piping. Skid shall include mounting hardware for integral aluminum enclosure.
- k) The enclosure shall be constructed of marine grade aluminum alloy 5052-H32 or minimum 14 gauge #304 stainless steel including the mounting base and fastening hardware with #4 polished finish. The system enclosure shall be vandal and weather resistant. The enclosure shall be low profile hinged top design with padlock provision. The cover shall be secured to the concrete pad with stainless steel hardware.

Power, low voltage, and plumbing connections shall be contained within the enclosure and shall be full grounded.

- l) Pump Assembly shall include the following options **unless specified otherwise:**
- a. Hydraulically controlled, diaphragm actuated pressure-regulating valve, cast iron bronze trim with epoxy coated body, equipped with flow clean strainer option. Valve to provide constant downstream pressure regardless of pump discharge pressure.
 - b. Low suction pressure switch mounted on suction manifold and interconnected to time delay relay adjustable from 0 to 5 minutes to shut down pump on low suction pressure.
 - c. Low system pressure switch mounted on discharge manifold and interconnected to time delay relay adjustable from 0 to 5 minutes to shut down pump on low system pressure.
 - d. High temperature non-adjustable thermostat mounted on pump discharge to shut down pump on heat buildup in pump casing due to no-flow situations. Set for 130 degrees F.
 - e. Loss of Prime Electrical Current Measurement Control Sensor Switch mounted in control panel to shut down pump on loss of suction fluid or loss of prime.
- n) A factory trained, service professional shall be required on the job site to verify proper installation and perform the startup and instruct operating personnel. A startup report containing voltage and amperage readings, suction and discharge pressure readings, estimated flow conditions, and general operating characteristics shall be submitted to the Owner.
- o) Four sets of operating and maintenance manuals shall be provided to the Engineer after startup and shall include parts manuals for components, performance curve for pump, general sequence of operation, and electrical schematic for control panel.

212-2.4 Sprinkler Equipment. First paragraph, DELETE second sentence.

Third paragraph, REVISE to read as follows:

Fixed heads, shrubbery heads and bubbler heads shall have adjustable radius control.

ADD: 212-2.4.1 Low Flow Irrigation Equipment.

212-2.4.1.1 Pressure Regulator. Pressure regulators shall be preset in line regulators set not to exceed the manufacturer's pressure rating of the emitter head or drip tubing. Pressure regulators shall be constructed of high-impact thermoplastic with fixed stainless steel compression spring housed in separate chamber from the normal water flow. The size shall be as specified as shown on the Plans.

212-2.4.1.2 Filter. Filters shall be provided in each valve servicing low flow irrigation systems. The filter shall be line-size with 2 piece threaded housing with O-ring seal, molded from high heat and chemical resistant ABS plastic, and have a ball flush valve connected. The filter screen shall be stainless steel with 150 mesh size (100 Micron) with the collar molded from vinyl.

212-2.4.1.3 Air Relief Valve. The air relief valve shall be located at the highest end of each lateral for low flow Irrigation systems. Air relief valve shall be manufactured from non-corrosive material with 1/2" male pipe thread. Maximum operating pressure shall be 100 PSI.

212-2.4.1.4 Flush Valve. Flush valve shall automatically operate at the start of each irrigation cycle. The flushing water volume shall be 1 gallon per cycle.

212-2.4.1.5 Drip Emitter. The emitters shall uniformly regulate the water discharged from each port at the rate specified on the plans. The emitter shall be multi-outlet made of UV resistant polymer and resistant to impact and high temperature. The emitter shall have a minimum of 6 independent barbed outlet ports that are mounted on the bottom of the device and that securely retain ¼" distribution tubing. The body shall have a ½" female pipe thread connection.

212-2.4.1.6 Drip Tubing. The distribution drip tubing shall be constructed from UV resistant polyethylene materials. The drip tubing shall be secured with 4" minimum length tubing stake, constructed of UV-resistant plastic material sized to accommodate the drip tubing. Tubing shall be installed with protective distribution cap (i.e., Bug Cap). Bug Cap shall have a barb inlet and a flanged shield. The barb inlet shall fit into ¼" distribution tubing with ID of 0.16 inches (4 mm). The flanged shield of the Bug Cap shall diffuse water to minimize soil erosion at emission point. The Bug Cap shall be made of polyethylene.

Tubing shall conform to the following:

- a) ¼" tubing designed for use with all drip systems
- b) Wall Thickness: 0.04" (1mm)
- c) 60 psi rating
- d) Compatible with all ¼" transfer fittings and all barbed outlet ports

212-3.2.1 Conduit. DELETE in its entirety and SUBSTITUTE with the following:

Rigid non-metallic conduit shall conform to the requirements of the UL Standard for Rigid Non-Metallic Conduit, Publication UL 651 (PVC Schedule 80) and UL 651B (HDPE). Rigid non-metallic conduit connections shall be of the solvent weld type. For underground installation, conduit shall be UL approved heavy wall polyvinyl chloride (PVC Schedule 40) unless specified otherwise on the Plans.

212-3.2.2 Conductors. REVISE section to read as follows:

"Line voltage conductors shall be supplied in the sizes and types shown on the Plans and shall be solid copper, THW, 600-volt insulation rating, conforming to the applicable provisions of ASTM D 734. Low voltage control conductors shall be Type UF, solid copper and supplied in the sizes shown on the plan or in accordance with the control equipment manufacturer's recommendation, and shall be UL approved for direct burial installation."

Control wires (#14 AWG) shall be color coded per station as follows:

- a) 1/19 Yellow
- b) 2/20 Orange
- c) 3/21 Blue
- d) 4/22 Black
- e) 5/23 Brown
- f) 6/24 Purple
- g) 7 Yellow w/ Black stripe
- h) 8 Orange w/ Black stripe
- i) 9 Red w/ Black stripe
- j) 10 White w/Red stripe
- k) 11 Yellow w/Red stripe
- l) 12 Blue w/ Red stripe

- m) 13 Orange w/ Red stripe
- n) 14 Purple w/ White stripe
- o) 15 Brown w/ White stripe
- p) 16 Yellow w/ White stripe
- q) 17 Blue w/ White stripe
- r) 18 Red w/ White stripe

Spare Wires: (Red) #14 AWG Two spare wires shall be provided from each of the furthest manifolds, in each direction to the controller, looping into a minimum of one valve box of each manifold along the wire run, to the controller.

Common Wires: (White) #12 AWG

Wire Bundles: Tape wire bundles with colored vinyl electrical tape 10' OC. Use different color tape for each controller.

ADD: 212-3.2.2.1 Wire Connectors. Wire connectors for direct burial irrigation control wires of 30v or less shall be capable to accommodate #18, #14, #12 and #10 gauge wire sizes and shall be designed to ensure waterproof connections. The wire connector kit shall contain a UL and CSA listed copper crimp sleeve, polyethylene connector body and polyethylene connector plug. The connector plug shall be filled with blue color self curing epoxy resin sealant immediately prior to assembly of the wire connector to fully waterproof the connection.

Wire connectors shall be installed in accordance with the manufacturer's recommendations. Wires shall be crimped and soldered together and inspected by the Engineer prior to placement into the wire connector plug and sealant.

ADD: 212-3.2.2.2 Wire Solder. Wire solder shall be 60% tin and 40% lead alloy wire with internal flux capable of quickly turning from a solid state to a liquid state when heated and capable of quickly returning to a solid state upon cooling.

ADD: 212-3.2.2.3 Trench Marker Tape. Trench marker tape shall be 3" wide and consist of a minimum 5.0 mil, five-ply 100% virgin polyethylene which is acid, alkaline and corrosion resistant. Elongation properties and tensile strength of not less than 7,800 psi shall be in accordance with ASTM D882-80A. The trench marker tape for water lines shall have a minimum 20 gauge solid aluminum foil core, adhered to a 2.55 mil polyethylene backing.

Tape color and legend shall be placed beneath the top protective layer subject to the following:

- a) Blue with "Caution Irrigation Line Buried Below" for irrigation mainlines and over pipe sleeves.
- b) Purple with "Caution Recycled/Reclaimed Water Line Buried Below" for recycled water irrigation mainlines.
- c) Red with "Caution Electric Line Buried Below" for electrical lines servicing the irrigation system, including, but not limited to, 110/220v power to irrigation controllers and pumps, communication cables and irrigation direct burial control wires to remote control valves.

SECTION 213 - ENGINEERING FABRICS

213-1.1 General. DELETE in its entirety and SUBSTITUTE with the following:

This work shall consist of furnishing and installing a fiberglass or a polyester and fiberglass interlayer-paving mat i.e., TruPave Paving Mat manufactured by Owens Corning, GlasPave25 Pavement Mat manufactured by Saint-Gobain Technical Fabrics, or approved equal. The paving mat shall be constructed of a wet-formed nonwoven material consisting of at least 60% fiberglass by weight, the remainder comprised of polyester and binder or acrylic polymer coating. The material shall be resistant to chemicals, mildew and rot, and shall not have any tears or holes that will adversely affect the in-situ performance and physical properties of the installed material. The paving mat shall meet the physical requirements in Table 213-1.1(A).

Table 213-1.1(A)

Property	ASTM Test No.	Requirements
Mass per unit area, oz/yd ² (g/m ²)	D5261	4.0 (136)
Tensile Strength lb/2 in (N/50 mm)	D5035	45 (>200)
Elongation at Break, %	D5035	<5
Melting Point, F(C)	D276	>446 (>230)
Minimum Average Roll Value oz/yd ² (g/m ²)	D5261	3.69 (125)

ADD: SECTION 215 – PRIVATE SEWER PUMPS

215-1 General. When noted on the plans the Contractor shall furnish and install complete private sewer pumping system including factory-built and tested grinder pump station(s), each packaged into a single complete unit consisting of dual grinder pump(s) suitably mounted in a basin constructed of high density polyethylene (HDPE), and with a quick disconnect assembly (NEMA 6P), anti-siphon valve, check valve, ball valve, and wet well within the basin, an electrical alarm and disconnect panel mounted on a wall or stainless steel pole and supplied with 240V electricity, 1.25" force main, and all necessary internal wiring and controls, at the locations shown on approved Working Drawings. Private pumping systems shall be installed in compliance with the applicable state and local codes and manufacturer's recommendations.

215-1.1 Manufacturer. The private sewer pump shall be as manufactured by E/ONE Sewer Systems or an approved equal product for use in low pressure sewage systems. The Contractor shall submit evidence of an established service program, complete parts and services manuals, and continuous inventory of grinder pump replacement parts from the manufacturer in accordance with 2-5.3, "Submittals." The Contractor shall provide a reference and contact list from 3 of the manufacturer's grinder pump installations completed within the last 2 years. The private sewer pump manufacturer shall have local service personnel to replace or repair the private sewer pump during the specified warranty period.

215-1.2 Pump Model. The private sewer pump model shall be a standard height model that is field adjustable (i.e., DH152-93) manufactured by E/ONE Sewer Systems or an approved equal **unless specified otherwise in the Special Provisions or shown on the Plans**. The private sewer pump model shall be sized to the expected discharge flow of the facility measured in gallons per minute and to the system's discharge invert elevation. The pump model shall also have a generator adaptor and load transfer switch to use generator power during power outages.

215-1.3 User Manual and Instructions. Following installation, the Contractor shall review with the property owner the pump system and provide a detailed user manual to the property owner.

ADD: SECTION 216 – DETECTABLE WARNING TILES

216-1 DETECTABLE WARNING TILES (DWT).

216-1.1 General. This section includes specification for DWT, embedded in an inline dome pattern, on all curb ramps and walking surfaces at locations and to the dimensions shown on the Plans, in accordance with these special provisions and the following references:

- a) Americans with Disabilities Act (Title III Regulations, 28 CFR Part 36 ADA STANDARDS FOR ACCESSIBLE DESIGN, Appendix A, Section 4.29.2 DETECTABLE WARNINGS ON WALKING SURFACES).
- b) California Code of Regulations (CCR) Title 24, Part 2, Section 1102B definition of "Detectable Warning," Section 1127B.5.7 for "Curb Ramps," Section 1133B.8.5 for "Detectable Warnings at Hazardous Vehicular Areas" and California Department of General Services Division of the State Architect's (DSA) Interpretation of Regulations Document IR 11-B4.

216-1.2 Materials. Materials for DWT specified herein shall be per the City's Approved Materials List (AML).

- a) The Stainless Steel Cast in Place DWT shall be of 16 gauge Type 304L with an integral micro-texture non-slip surface stamped into the stainless steel plate on the top of the domes and in the field surface between the domes. It shall have an ultra violet stabilized coating.
- b) Vitrified Polymer Composite (VPC) Cast in Place DWT shall be an epoxy polymer composition with an ultra violet stabilized coating employing aluminum oxide particles in the truncated domes.
- c) For others materials and a complete listing of material physical property requirements refer to the City's AML.

216-1.3 Manufacturers. Materials from the Manufacturers listed in these specifications or on the City's AML do not require a submittal. In lieu of the submittal, the Contractor is required to certify in writing, that material incorporated in the Work comply with the Contract Documents. For any substitutions requested by the Contractor, refer to the City's AML for DWT.

PART 3 CONSTRUCTION METHODS

SECTION 300 – EARTHWORK

300-1.1 General. ADD the following:

Where parkway trees have been removed, large amounts of tree roots may be encountered. Remaining tree roots shall be removed to a depth of 4" below the new 4" thick walk in all areas between the curb and the property line. New, non-expansive soil shall be used for backfill and compaction as needed to establish proper grade and compaction. The new walk and parkway area shall meet existing grade and provide a positive slope away from the property.

Where parkway trees have been left in place the roots may be partially cut to allow the Contractor to remove the damaged concrete and the underlying roots.

The Contractor shall not remove concrete on both sides of the tree unless approved by the Engineer.

300-1.3.2 Requirements. Paragraph C, ADD the following:

c) Concrete Curb, Walk, Gutters, Cross Gutters, Driveway, and Alley Intersections. The Contractor shall expect to encounter large amounts of tree roots. If the Contractor encounters tree roots larger than 16" in diameter, the Contractor shall notify the Engineer before the roots are removed. Work at a specific location shall not commence until the Contractor's measurements have been accepted by the Engineer.

Large tree roots shall be removed, including, cutting, excavations, disposal and backfill. Some locations involve the prior removal of an existing tree, in the parkway area and will affect the final work product. Other locations involve working around a tree that has been root pruned. The Contractor shall exercise due caution when working around the remaining trees not to damage either the trunk or any of its limbs. If damage to a limb occurs, the Contractor shall notify the Engineer. Once excavation has occurred, all efforts shall be made to minimize the exposure of the tree roots to the air by expediting the forming and pouring of concrete at that location.

At the discretion of the Engineer, the Contractor shall either dispose of ornamental hardscape within the right of way, or stack it neatly in a location approved by the Engineer for the property owner's use.

ADD the following:

d) Tree Removal. Removal of a tree shall include removing from the site at the end of each Working Day all trimmings, wood stumps, roots 4" or larger, surface roots, other vegetation, debris, and litter resulting from the Contractor's operation. Cut trees shall not be stacked for future pick-up, chipping, or both. Roots having a diameter of 4" or more shall be traced out and removed to a minimum of 2' from the stump crown. Roots 4" or more in diameter, the tops of which are 6" or less below the existing soil level, shall be considered a part of the stump and shall be removed, except where such removal is prevented by existing walks, curbs, buildings, or other improvements.

Stumps shall be removed to a minimum of 15" below existing finished grade or at the depth approved by the Engineer. Where the stump removal operation intercepts an in-service utility line, removal of the stump shall be made to the top of said utility line with the remaining portion of the stump, not obstructed by the utility line, removed to the required 15" minimum depth. No stump shall be left for more than 1 day following removal and shall be secured with barricades and mounted flashes. The Contractor shall remove and properly dispose of all non-millable material generated by the removal operation including stump grinding, as required above.

Where holes or depressions resulting from the removal of trees, stumps, shrubs, or palms, the Contractor shall supply standard clean top soil, backfill, and firmly compact to finish grade, making a smooth transition to adjacent ground or pavement level as applicable. The cavities shall be backfilled

the same day following the removal, unless otherwise directed by the Engineer. The topsoil shall be Class A or **as specified otherwise in the Special Provisions.**

Where there is a difference in value between the tree lost due to the Contractor's operation and the replacement tree, the difference will be deducted from the Contract payment. The value of the tree lost shall be determined by the Engineer, using the latest International Society of Arboriculture (I.S.A.) guidelines for value determination.

If a tower truck will be required in medians, right-of-ways, and at other sites where the trees can be reached, it shall not be placed on the lawns. Spikes shall not be used except when approved by the Engineer.

e) Removal and Disposal of Railroad Tracks. In any location where abandoned railroad tracks or appurtenances are found to exist within the excavation, the railroad facilities shall be removed by the Contractor and properly disposed of. The removal shall include rails, ties, and any other associated facilities found within the excavation. Where the rail line lies only partially within the trench area, the entire width of the track shall be removed, including the entire length of each affected tie and both rails.

300-1.4 Payment. ADD the following:

Payment for the removal and disposal of existing pavement beyond 9" thick, within the excavation e.g., trench limits, shall be included in the Bid item for Additional Pavement Removal and Disposal, and no additional payment shall be made regardless of the total thickness and composition of existing pavement removed and disposed.

Payment for existing pavement removal and disposal of up to nine 9" thick, within the excavation e.g., trench limits, shall be included in the Bid item for installation of the mains or the Work item that requires pavement removal.

Removal and disposal of railroad tracks within the excavation shall be measured along the centerline of each pair of rails to be removed. The Contract bid price for removal and disposal of railroad tracks shall include all work necessary to remove and dispose of the tracks.

Demolition, removal, and disposal of various types of existing hardscape in parkway areas, such as colored concrete, bricks, flagstone in the parkway or right of way, shall be included in the Bid item for Miscellaneous Hardscape Remove and Replace with Topsoil.

Payment for the removal and disposal of large tree roots as defined in these specifications shall be included in the Bid item for Large Tree Root Removal.

Work related to large tree removal shall be included in the Contract bid price for Tree Removal.

300-4.4 Benching. First paragraph, DELETE the second sentence and SUBSTITUTE with the following:
A minimum 6' (1.8 meter) horizontal bench shall be constructed to ensure that the new work is constructed on a firm foundation free of loose or disturbed material.

300-11.2 Placing Stone. ADD the following:

When noted on the Plans, rock slope protection shall be placed in accordance as follows:

A footing trench shall be excavated along the toe of the slope as shown on the Plans.

Rocks shall be so placed as to provide a minimum of voids and the larger rocks shall be placed in the toe course and on the outside surface of the slope protection. The rock may be placed by dumping and may be spread in layers by bulldozers or other suitable equipment.

Local surface irregularities of the slope protection shall not vary from the planned slopes by more than one foot measured at right angle to the slope. At the completion of slope protection work, the footing trench shall be filled with excavated material and compaction will not be required.

SECTION 301 – TREATED SOIL, SUBGRADE PREPARATION AND PLACEMENT OF BASE MATERIALS

301-1.2 Preparation of Subgrade. After first paragraph, ADD the following:

Subgrade soil shall be tested for expansive potential in accordance with ASTM Test Method D4829. If expansive soil is encountered within the roadway improvements and extending beyond the limit of paved sidewalks, curb and gutter or edge of pavement, then expansive soil subgrade shall be removed, and replaced with a non-expansive material having an expansion index of less than 20 (ASTM D4829). “R” value shall be determined on the original soil for pavement design. The depth of excavation will be based on the Expansive Index of the native soil in accordance with the following table:

Expansive Index of native subgrade soil	Minimum depth of expansive materials to be removed and replaced (in inches)
0-50	None
51-90	18
91-130	24
Above 130	36

Removal shall extend beyond edge of sidewalk a horizontal distance equivalent to the minimum depth of removal.

The Contractor may submit an optional plan for soil treatment to the Engineer for review and approval in accordance with 2-5.3, “Submittals.”

Disintegrated Granite (DG) shall be used as backfill material in the parkway at commercial locations or high pedestrian traffic access, as directed by the Engineer.

301-1.3 Relative Compaction. First paragraph, REVISE to read as follows:

When pavement, base, subbase, or cross gutter is to be placed directly on subgrade material, the top 12” (300 mm) of subgrade material in streets and alleys shall be compacted to a minimum density of 95% relative compaction. When curb, gutter, driveways, or sidewalks are to be placed on the subgrade material, the top 6” (150 mm) of such subgrade material shall be compacted to a relative compaction of 90%.

ADD the following:

The subgrade shall be tested with a loaded truck of ten ton capacity or greater, and having a load of 75 pounds (34 kilogram) or more per square inch of the tire contact area. The subgrade shall support this load without perceptible indentation or movement. The base, surfacing or pavement shall not be scheduled for construction until the subgrade has been tested and approved by the Engineer.

301-1.6 Adjustment of Manhole Frame and Cover Sets to Grade. DELETE in its entirety and SUBSTITUTE with the following:

- a) Castings, pre-fabricated risers, frames or covers of existing City manholes or gate valves, shall be adjusted to conform to the new grade by the Contractor.
- b) Sewer and storm drain manhole covers shall be raised by installing pre-fabricated risers manufactured in 1" increments. In some locations, due to existing condition of the manhole,

the Engineer may require digging up the existing manhole and repairing according to the following criteria:

- i. The pavement shall be cut to a width of no less than 8" or more than 12" and a depth of no less than 6" around the circumference of the manhole frame. The outside cut shall be as neat and clean as possible to insure a smooth joint between asphalt and concrete collar.
 - ii. Once the frame has been broken loose and the debris is cleared away, the frame shall be shimmed to match the new grade. Only broken brick shall be used for shimming as it will remain a permanent part of the frame base. The space shall then be grouted to insure total and complete support of the manhole frame.
 - iii. The concrete collar shall then be poured and finished to insure a level, smooth connection between the asphalt pavement and manhole. Manhole frames shall be set in Class "C" mortar.
- c) Gate valve caps, casings and leveling shall be done after resurfacing. Measurements shall be made from the top of the new grade to the top of the gate cap to determine the length requirement for the extension of the valve riser casing. This extension shall be cut from 8" O.D. by 1/8" steel casing only. The gate valve cap shall be removed, the extension placed on the existing riser casing, the gate valve cap replaced and checked for assurance as to height and levelness. The extension shall be circumferentially welded to the old casing.
- d) In the event that an old style casing of a different size is found, the following procedures shall be followed:
- iv. Pavement around the gate valves shall be cut to a width no less than 6" or more than 8" and to a depth of no less than 8" around the circumference of the valve casing. The new casing shall then be placed around or inside the old casing.
 - v. A concrete collar shall be poured and finished to insure a level, smooth connection between asphalt and gate valve cover. Eight inch gate caps will be furnished by the City to replace old odd-size caps.
 - vi. Gate valve caps and sewer manholes, covered by resurfacing, will be located and marked out by City Forces and shall be raised by the Contractor in the same manner described in these specifications.
 - vii. Except for those areas which have been identified for cold milling in accordance with 302-1, "COLD MILLING OF EXISTING PAVEMENT" the Contractor shall be responsible for locating all metal objects in the area shall be milled.

301-1.7 Payment. DELETE Paragraphs 3 and 4 in their entirety and SUBSTITUTE with the following:

Payment for adjusting existing manhole frames and gate valve covers to grade shall be made at the Contract unit price for each manhole frame and gate valve cover.

Last paragraph, REVISE to read:

If no provision for manhole adjustment or reconstruction is made, payment for such work will be deemed to be included in the other items of work and no additional payment will be made.

ADD the following:

When used, DG shall be included in the Contract unit price bid for "Miscellaneous Hardscape Remove and Replace with Topsoil" unless a separate Bid item has been provided.

301-3.1.5 Cement Application, Mixing, and Spreading. DELETE first sentence in its entirety and SUBSTITUTE with the following:

Mixing of the soil, cement, and water shall be accomplished by the central plant-mixed method only.

301-3.1.8 Placing, Compacting, and Finishing. ADD the following:

Vibratory rollers shall not be used for finish rolling of cement treated base.

301-3.3.3 Central-Plant Mixing. Second paragraph, ADD the following:

The cement feeder shall be equipped with a device by which the rate of cement feed can be determined while the plant is in full operation.

301-3.3.4 Placing, Compacting, and Finishing. ADD the following:

Asphalt concrete paving on Cement-Treated Base at an earlier date than the seventh day will be permitted upon approval of the Engineer, but no paving will be permitted between the day CTB is placed and 5 days after the treated base has been placed.

Failure to meet the compaction requirements of the treated base shall modify the placement of paving in the following manner:

<u>Compaction</u>	<u>Before 7 Days</u>	<u>7 Days or Greater</u>
90-95%	Paving Not Permitted	Paving Permitted

301-3.3.6 Measurement and Payment of Cement-Treated Base (CTB). REVISE section to read as follows:

Cement-treated base and subbase shall be paid for by the ton, complete in place as shown on the plans or as directed by the Engineer. Furnishing, mixing, spreading, shaping, compacting, trimming and curing of the treated materials shall be included in the Bid item for CTB.

SECTION 302 – ROADWAY SURFACING

ADD: 302-0 General. Prior to roadway resurfacing or the application of slurry, the Contractor shall complete all necessary preparation and repair work to the road segment e.g., tree trimming, weed spray, weed abatement, crack sealing, asphalt repair, hump removal, miscellaneous asphalt patching, removal of raised pavement markers, removal of pavement markings, etc. and **as specified in the Special Provisions**. No preparatory asphalt work shall be done when the atmospheric temperature is below 50 °F or during unsuitable weather.

302-1 COLD MILLING OF EXISTING PAVEMENT. ADD the following:

- Excessive asphalt concrete pavement adjacent to Type "G" and "H" curb and gutter line, and concrete cross gutters shall be milled in accordance with City of San Diego Standard Drawing SDG-139 "Cold Milling Asphalt Concrete Pavement Detail". Cross gutters shall be cold- milled 1" plus or minus 1/4", within 24 hours or less, of the time the resurfacing shall be placed.
- Milled widths of pavements shall be continuous except for intersection at cross streets where the milling shall be carried around corners and day lighting at the point of curb-return.
- Typically the City uses 7" – 9" of concrete with a 1/4" of asphalt on top to cap all utility trenches.
- Milled widths of pavements shall be continuous except for intersection at cross streets where header cuts shall day light at the point of curb-return, or as directed by the engineer.

Typically Header cuts shall be 12' in width at intersections, cross gutters, and paving limits, or as directed by the Engineer.

- e) The City acknowledges that certain unidentified utility facilities, (buried metal objects) i.e.; magnetic traffic pads, sewer/storm drain manhole covers, water valve covers, and survey monuments etc. have been inadvertently paved over on some streets in past projects. These facilities may not be readily apparent from a visual inspection of the project or an examination of "as-built" records.
- f) The Contractor shall make reasonable efforts to locate said objects. The Contractor shall examine any available as-built records, properly notify "UNDERGROUND SERVICE ALERT", (USA) and request that all utility lines, covers, and facilities within 6" of the surface be identified and marked. If requested by the Engineer, documentation shall be provided to the Engineer that this service was completed.
- g) The Contractor shall sweep all street locations with a metal detector ahead of the milling operation. Suspected buried metal objects shall be identified by a painted cross within an outlined area in a manner allowing the milling operation to see the questionable area, and take corrective action. Any damage incurred by the milling machine striking a buried metal object within a 3' radius of such a marking shall be at the Contractor's expense.
- h) At each street location screened with a metal detector, the Contractor shall note that the street has been checked, by painting a check mark at a location that is approved by the Engineer. This mark should be visible to the Engineer and the milling operator, but shall not be placed to divert or confuse public traffic.
- i) The Engineer shall be notified a minimum of 24 hours in advance of any street that is to be swept for buried metal objects. Proper traffic control shall be erected and maintained for all metal detection operations. If, after any given street has been checked with the metal detector, the milling operation hits more than 2 buried objects, then the Contractor shall revise their methods and re-check street locations at the Contractor's expense.
- j) Any damage incurred by the Contractor on streets which have not been swept with a metal detector, or after the second object has been struck, and before the street (s) have been rechecked shall be at the Contractor's expense.
- k) In the event that buried metal objects, (City utility facilities) are nonetheless encountered notwithstanding the above mentioned procedures, then the City will pay for the costs resulting from the striking of the said obstacle in accordance with 3-3, "Extra Work."
- l) The City will not be responsible for any damage to or caused by buried metal objects that are not in the City's control/jurisdiction, i.e.; San Diego Gas & Electric, Other Water Supply Agencies, Cable TV companies, and telephone and communication companies, etc. Damage claims shall be filed with those individual companies or agencies.
- m) Equipment other than milling machines may be utilized to achieve the removal of distressed asphalt pavement subject to the approval of the Engineer.
- n) Full width cold milling of existing streets to a minimum depth of 1½" unless noted in the Contract Documents or as directed by the Engineer to eliminate excessive crown, old oxidized asphaltic pavement, and surface cracking of old asphalt overlays shall be done as listed in these specifications. Cold milling full width locations shall be paved within 3 days.

302-1.1 General. ADD the following:

The following construction requirements shall apply to the milling operation:

- a) Asphalt concrete pavement adjacent to Type "G" and "H" curb and gutter line, and concrete cross gutters shall be milled in accordance with milling details in City of San Diego Standard Drawing or as shown on the Plans. In areas where the curb height has been diminished by

multiple overlays, the milling depth shall equal the proposed overlay thickness. Cross gutters shall be cold milled minimum 1.5", within 5 days, of the time the resurfacing shall be placed.

- b) Milled widths of pavements shall be continuous except for intersection at cross streets where the milling shall be carried around corners and day lighting at the point of curb-return, the header cuts shall day light at the point of curb-return, or as directed by the Engineer.
- c) Header cuts shall be 12' in width at intersections, cross gutters, and paving limits, or as directed by the Engineer.
- d) Certain unidentified utility facilities, (buried metal objects) i.e.; magnetic traffic pads, sewer and storm drain manhole covers, water valve covers, survey monuments, etc. have been inadvertently paved over on some streets. These facilities may not be readily apparent from a visual inspection of the project or an examination of "as-built" records. The Contractor shall be responsible for locating and protecting these facilities per 5-1, UTILITIES.

Any damage incurred by the milling machine striking a buried metal object within a 3' radius of the utility Mark-up shall be at the Contractor's expense.

At each street location the Contractor shall note that the street has been checked for utilities, by painting a check mark at a location that is approved by the Engineer. This mark should be visible to the Engineer and the milling operator, but shall not be placed to divert or confuse public traffic.

The Engineer shall be notified a minimum of 24 hours in advance of any street that is to be checked for buried metal objects. If, after any given street has been checked, the milling operation hits more than 2 buried objects, the Contractor shall revise its method and re-check street locations at the Contractor's expense.

Any damage incurred by the Contractor on streets which have not been checked, or after a second object has been struck, and before the street (s) have been rechecked, shall be at the Contractor's expense.

- e) If approved by the Engineer, equipment other than milling machines may be utilized to achieve the removal of distressed asphalt pavement.
- f) When required to eliminate excessive crown, old oxidized asphaltic pavement, and surface cracking of old asphalt overlays full width cold milling of existing streets shall be done to a minimum depth of 1.5". Cold milling full width locations shall be paved within 3 days.

ADD: 302-1.1.1 Removal of Humps and Pavement Irregularities. Removal of humps and pavement irregularities include i.e., areas 1" or more above the finished grade of the existing pavement surface) as marked in the street or as directed by the Engineer. The removal of the hump or irregularity may be done either by milling or other means. The required hot mix asphalt concrete patching shall be C2 PG 64-10 in accordance with Section 400-4, "ASPHALT CONCRETE."

At the end of each day, the Contractor shall submit to the Engineer an itemized list of the areas where removal of humps was completed. The list shall include the location of the work and the exact length in linear feet.

302-1.6 Cold Milling of Composite Pavements. ADD the following:

The City typically uses up to 9" of concrete with ¼" of asphalt to cap utility trenches.

302-1.9 Traffic Signal Loop Detectors. ADD the following:

The Engineer will determine which traffic detector loops to be replaced unless specified in the Contract Documents.

Traffic detector loops shall be reinstalled within 15 days from completion of resurfacing of the related street. The Contractor shall contact the City of San Diego's Communications and Electrical Division, Traffic Signal Maintenance at 619-527-8052 north of interstate 8 or 619-527-8053 south of interstate 8 to request loop layout.

Traffic Signal Maintenance will layout locations and size of new loops and will inspect the installation. The Contractor shall be responsible for making field connections. The Contractor shall obtain prior approval from the Electrical Division for each traffic loop stub out replaced.

Traffic detector loops installed either in the new street surface or in the original street surface after grinding or repairs shall be Caltrans type "E" loops described in Caltrans Standard Plan ES-5B. The front loop at the stop line shall have 4 turns instead of 3 that is required by Caltrans. Asphaltic emulsion loop sealants shall not be used when installing traffic loops on the street surface.

302-1.10 Pavement Transitions. ADD the following:

Where transverse joints are milled in the pavement at conform lines no drop off shall remain between the existing pavement and the milled area when the pavement is opened to public traffic. If asphalt concrete has not been placed to the level of existing pavement before the pavement is to be opened to public traffic, a temporary asphalt concrete taper shall be constructed. Asphalt concrete for temporary tapers shall be placed to the level of the existing pavement and tapered on a slope of 15: 1 or flatter to the level of the planed area. Asphalt concrete for temporary tapers shall be commercial quality and may be spread and compacted by any method that will produce a smooth riding surface. Temporary asphalt concrete tapers shall be completely removed, including the removal of all loose material from the underlying surface, before placing the permanent surface.

302-1.11 Measurement. ADD the following:

The Contractor shall expect to encounter incidental concrete pavement while milling various areas. In the event that additional concrete in excess of fifteen 15% of the total area milled in a particular street segment (block) is encountered, payment shall be made for the entire area at the Contract unit price for Cold Milling Additional PCC. Prior to paving over the milled areas, the Contractor shall notify the Engineer that the incidental amount has been exceeded.

At the end of each day, the Contractor shall submit to the Engineer an itemized list of the areas where removal of humps was completed. The list shall include the location of the work and the exact length in linear feet. Measurement for the removal of street humps and pavement irregularities prior to the placement of asphalt concrete shall be of actual areas and depths authorized by the Engineer calculated in lineal feet, based on one lineal foot by six foot drum width.

302-1.12 Payment. ADD the following:

Since some traffic detector loops may escape damage, the Contractor will be paid for only those loops installed. Payment for the replacement of traffic detector loop and appurtenances shall be included in the Bid item for each traffic signal loop and appurtenances as shown in the Bid.

Payment for the removal of humps and other pavement irregularities shall be included in the Contract unit price per lineal foot for "Removal of Humps & Pavement Irregularities." No additional payment shall be made for incidental asphalt patching required after hump removal.

302-4.2.1 General. ADD the following:

Mixing shall be performed by a continuous-flow mixing machine. Mixing shall continue until all particles are uniformly saturated and coated with asphalt. Evidence of solidification of the asphalt, balling or lumping of the aggregates, or the presence of uncoated aggregates, shall be cause for

rejection of the mixture. The aggregate shall be at atmospheric temperature and shall not have a moisture content in excess of 5% of dry weight. The moisture content shall be determined before loading the aggregate on the slurry truck.

Evidence of solidification of the asphalt, balling or lumping of the aggregates, or the presence of uncoated aggregates, shall be cause for rejection of the mixture. Consistency of the mixed slurry shall be measured using a machined-surface brass cone per ISSA test 106/ASTM C-128.

ADD: 302-4.2.1.1 Slurry Consistency (Slurry Slump Test). Consistency of the mixed slurry shall be measured using a machined-surface brass cone (per ISSA test 106/ASTM C-128). The cone shall be a hollow .8 mm minimum metal frustrum, 75 mm high, with 40 mm top inside diameter, and 90 mm inside base diameter. The flow scale shall consist of 7 concentric circles in one centimeter increasing radii from the circle formed by the outside larger end of the slump cone. The material on which the 7 concentric rings appear shall be; 8 ½" x 11" Xerox paper "Simpson # 7 ID 13351 10 M" or equal.

The test will consist of sampling the mixed slurry, then immediately pouring the sample into the top of the cone. Strike the slurry off even with the top of the cone, and then raise the cone immediately. The flow shall be measured at four points 90 °C apart and then averaged. The average shall be between 2.0 and 3.0 cm. If the slurry mix is not within these specifications, the water content of the slurry shall immediately be corrected to meet these specifications.

302-4.3.1 General. ADD the following:

The Contractor shall be fully responsible for locating and obtaining permission to use stockpile sites. Aggregate may be stockpiled on public property sites approved by the City.

Where the Contractor may find it advantageous to use private property, he shall make its own arrangements for its use, and to obtain appropriate permits, and shall assume full responsibility for its rental, preparation, and maintenance. The Contractor shall clean up public or private property in a manner satisfactory to the City and the property owner. Precautions shall be taken to ensure that stockpiles do not become contaminated with oversized rock, clay, silt or excessive amounts of moisture; segregation of the aggregate will not be permitted. Aggregate samples will be taken from field stockpile location prior to any addition of mineral fillers such as cement or lime, to determine the sand equivalent value in accordance with 203-5.2, "Materials." The addition of mineral fillers such as cement, lime or sulphates may be added during application of the slurry mixture to the City streets.

The Contractor shall provide suitable storage facilities for the asphalt emulsion. Suitable heat shall be provided as necessary.

Immediately prior to slurry sealing operations all utilities covers and monuments shall be covered by heavy plastic material, or other means approved by the Engineer. Covers and voids around frames are to be cleaned of slurry material by the end of the same work day. If the utility covers are not cleaned by the following day, no additional slurry seal shall be placed until the covers are cleaned.

Prior to the application of slurry to any road segment, the Contractor shall complete all necessary repair work to the road segment in a manner satisfactory to the Engineer and in accordance with these Specifications. Preparatory work shall include tree trimming, weed spray, weed abatement, crack sealing, asphalt repair (mill & paves), hump removal, miscellaneous asphalt patching, removal of raised pavement markers, removal of pavement markings, etc. No preparatory asphalt work shall be done when the atmospheric temperature is below 50 degrees Fahrenheit or during unsuitable weather.

Decorative and tile walkway crossing shall be protected from slurry seal operation.

Care shall be exercised to ensure the maximum rate of application with no excess, and leaving no unsightly appearance. The Contractor shall be responsible for the removal of all excess emulsion spread beyond street limits, on driveways, sidewalks, etc.

Not less than 5 days or more than 30 days following placement of slurry seal, the street will be re-swept to remove the gravel rebound from vehicular traffic. No separate payment will be made for this service.

302-4.3.2 Spreading. ADD the following:

When REAS specified, it shall not be applied when the pavement and atmospheric temperature is less than 10 °C (50 °F) and falling and when the temperature at 7 AM is 24 °C (75 °F) or over, and rising to a forecasted high of 38 °C (100 °F), or when high relative humidity would prolong the curing beyond a reasonable time.

The application of slurry shall be during Normal Working Hours **unless specified otherwise in the Special Provisions or shown on the Plans.**

No slurry shall be applied when the weather forecast exceeds a 50% probability of rainfall; when the air or pavement temperature is no higher than 50° and falling; when the temperature at 7:00 A.M. is 75° and rising to forecast high of 90° or more; or when high relative humidity would prolong the curing beyond a reasonable time. Slurry may be applied when both air and pavement temperatures are 45° and rising.

Immediately prior to spreading the slurry, the Contractor shall clean the surface and remove all loose material, silt spots, vegetation or other objectionable matter, and thoroughly sweep from curb face to curb face with a pickup power sweeper. Slurry will not be applied until the surface condition is satisfactory to the Engineer.

Power sweepers or other equipment used to clean the surface shall be those normally used for the purpose and shall be approved by the Engineer.

The surface of pavement shall be fogged with water directly preceding the application of the slurry. The slurry mixture shall be of the designed consistency when deposited on the surface and no additional elements shall be added. Total mixing time shall not exceed 4 minutes. A sufficient amount of slurry shall be carried in all parts of the spreader at all times so that complete coverage is obtained. No rippling, lumping, balling or unmixed aggregate shall be permitted, nor shall segregation of the emulsion and aggregate fines from the course aggregate. If the coarse aggregates settle to the bottom of the mix, the slurry shall be removed from the pavement. No excessive braking of the emulsion in the spreader box will be allowed, nor shall the condition known as "skinning over/false set" of the slurry is allowed. No streaks such as caused by oversize aggregate will be left in the finished pavement. No more than 25% water can be used in the mixture without the approval of the Engineer (includes water in the emulsion and mixing water). No additional water shall be added after material leaves pug mill. If test results indicate that more than 25% of water has been added, the following monetary percentages (%) shall be deducted from that day's pay:

<u>Total % of Water</u>	<u>% Deduction</u>
0 - 25.0	0
25.1 - 29.9	10
30.0 - 34.9	25
Over - 35.0	100

No excessive build-up causing unsightly appearance shall be permitted on longitudinal or transverse joints. Unless otherwise approved, the overlap at joints will not exceed two inches 2" and shall be

feathered; joints between asphalt pavement and concrete pavement and/or concrete gutters shall be completely and neatly sealed without excessive slop-over onto the concrete; and unsightly and objectionable excess shall be immediately removed. At street intersections at the beginning and end of work segments, the slurry shall be neatly spread or trimmed to a straight line defined by the near curb lines of the street adjacent to the work. The beginning and end of a slurry seal area shall be a clean, straight line created by placing 15 lb. felt paper to create the line. Asphalt alley aprons abutting streets to be slurry sealed shall be slurry sealed to straight cut off line.

Execution of a separate agreement by the City and the Contractor in accordance with 302-4.3.2.1, "Seasonal Work/Separate Agreement" shall constitute satisfactory completion of the slurry sealing work required by 302-4, "EMULSION-AGGREGATE SLURRY" for the purpose of filing the notice of completion for this contract. Prior to execution of the separate agreement by the City, the Contractor shall provide the City with: i) a faithful performance bond in the amount of 100% of the Contractor's Bid item for Work items covered by 302-4, "EMULSION-AGGREGATE SLURRY"; and ii) a certificate of insurance demonstrating in a manner satisfactory to the City that the Contractor has the insurance coverage required by the separate agreement.

ADD: 302-4.3.2.1 Seasonal Work/Separate Agreement. The slurry sealing work to be performed in accordance with 302-4, "EMULSION-AGGREGATE SLURRY" shall not be performed during the months of November, December, January, February, and March. If the Work performed in accordance with these specifications progresses such that the slurry sealing work would occur during the months specified above, the Contractor and the City shall enter into a separate agreement for performance of the slurry sealing work during an alternate time period. The separate agreement shall be in the form attached to the Contract documents **as an Appendix.**

ADD: 302-4.3.2.2 Separate Agreement, Bond, and Insurance. Execution of a separate agreement by the City and the Contractor in accordance with 302-4.3.2.1, "Seasonal Work/Separate Agreement" shall constitute satisfactory completion of the slurry sealing work required by 302-4, "EMULSION-AGGREGATE SLURRY" for the purpose of filing the notice of completion for this contract. Prior to execution of the separate agreement by the City, the Contractor shall provide the City with: i) a faithful performance bond in the amount of 100% of the Contractor's bid item for 302-4, "EMULSION-AGGREGATE SLURRY"; and ii) a certificate of insurance demonstrating in a manner satisfactory to the City that the Contractor has the insurance coverage required by the separate agreement.

ADD: 302-4.3.4 Asphalt Patching. Asphalt patching shall consist of patching low spots in the pavement that are deeper than ½" per 302-5.6.2, "Density and Smoothness."

The areas requiring patching have been identified in the Contract Documents, marked on the streets, or as directed by the Engineer. The Contractor shall identify any new areas that may require patching prior to slurry work to ensure the smoothness and quality of the finished product.

302-4.5 Measurement and Payment. ADD the following:

The contract price per square foot shall include pavement markers and striping in accordance with 312-4, "MEASUREMENT AND PAYMENT" and 310-5.6.10, "Measurement and Payment."

Payment for asphalt patching shall be included in the Bid items for slurry seal as provided unless a separate unit price Bid item has been provided for asphalt patching for slurry seal.

ADD: 302-4.5.1 Measurement and Payment Under Separate Agreement. If the City and Contractor enter into a separate agreement for the slurry sealing work in accordance with 302-4.3.2.1,

“Seasonal Work/Separate Agreement” the Contractor will be paid for that work in accordance with the terms of the separate agreement.

302-5.1 General. First paragraph, REPLACE reference to Section 203-6, “ASPHALT CONCRETE” with Section 400-4, “ASPHALT CONCRETE.”

ADD: 302-5.1.1 Damaged AC Pavement Replacement. Prior to placement of AC overlay or slurry, all existing asphalt concrete pavement that is failing or in poor condition, as determined by the Engineer, shall be removed and replaced to a minimum depth of 2” for residential streets, and 3” for all others or as required to expose firm and unyielding pavement and replaced to existing pavement grade. The damaged AC pavement quantities may vary due to further deterioration of the pavement.

Damaged AC pavement replacement shall be subject to the following conditions:

- a) Asphalt overlay shall not be applied over deteriorated pavement. Preparatory asphalt work shall be completed and approved by the Engineer before proceeding with asphalt overlay.
- b) The Contractor shall remove distressed asphalt pavement either by saw cutting or milling, to expose firm and unyielding pavement; prepare subgrade (as needed); and install compacted asphalt concrete pavement over compacted native material as directed by the Engineer.
- c) The minimum dimension for each individual repair shall be 4’ x 4’.
- d) If the base material is exposed to achieve the required minimum removal thickness, the base material shall be prepared to 301-1, “SUBGRADE PREPARATION.”
- e) When additional base material is required, then the contractor shall use Class 2 Aggregate Base in accordance with 400-2.4, “Class 2 Aggregate Base.” Recycled base material shall conform to Crushed Miscellaneous Base Material in accordance with 200-2.4, “Crushed Miscellaneous Base.”
- f) Material removed, regardless of removal method, shall be disposed of at a legal site.
- g) The Contractor may use grinding as a method for removal of deteriorated pavement when the areas indicated for removal are large enough (a minimum of the machine drum width) and when approved by the Engineer.
- h) Prior to replacing asphalt, the area shall be cleaned and tack coated per 302-5.4, “Tack Coat”.
- i) Following the asphalt placement, the Contractor shall roll the entire patch in both directions covering the patch at least twice.
- j) After placement and compaction of the asphalt patch, the Contractor shall seal all finished edges with a 4” wide continuous band of SS-1H.
- k) Base repairs shall not exceed 20% RAP in content.
- l) For both scheduled and unscheduled base repairs, failed areas may be removed by milling or by excavation provided that the edges are cut cleanly with a saw. The areas shall be cleaned and tack coated in accordance with 302-5.4, “Tack Coat” before replacing the asphalt. The areas for scheduled repairs have been marked on the street.

ADD: 302-5.1.2 Measurement and Payment. At the end of each Working Day, the Contractor shall submit to the Engineer an itemized list of the asphalt pavement repair work completed. The list shall include the location of the Work and the square footage of the repair.

Payment for replacement of existing pavement including Class F asphalt when required shall be included in the unit bid price for Damaged AC Pavement Replacement for the total area replaced and no additional payment shall be made regardless of the number of replacements completed. No payment shall be made for areas of over excavation or outside trench areas in utility works unless previously approved by the Engineer. No payment for pavement replacement will be made when the damage is due to the Contractor's failure to protect existing improvements. The Contractor shall reimburse the City for the cost of retesting all failing compaction tests.

Payment for the repair work of existing substandard pavement that is outside the excavation limits e.g., trench limits and not affected by the Contractor's operations shall be included in the Bid item for asphalt pavement or slurry seal. The cost for all miscellaneous patching within the excavation limits e.g., trench limits, any areas where the pavement has been damaged by the Contractor's operations, or any areas not identified to the Engineer prior to trenching shall be solely the responsibility of the Contractor.

Payment for tack coating and base repairs, including any necessary base material and asphalt pavement repair shall be included in the Contract unit price per ton for damaged AC pavement replacement.

ADD: 302-5.4.1 Payment. The payment for tack coating in the areas not covered by fabric shall be included in the payment for AC Overlay and Striping.

302-5.5 Distribution and Spreading. ADD the following:

- a) Resurfacing shall be continuous through all intersections between the limits of the work segment, unless otherwise shown on the plans or directed by the engineer.
- b) If the street intersection has no parallel concrete cross gutters, resurfacing shall extend to the prolongation of curb or property line as directed by the Engineer. Where asphalt cross gutters are to be surfaced, the Contractor shall furnish and have available, a straight-edge and level. Under the direction of the Engineer, the drainage flow of the cross gutter shall be maintained.
- c) Asphaltic material shall be hand-raked to remove coarse aggregate and feathered, allowing the fine materials to cover the existing street surface adjacent to concrete gutters and concrete cross gutters. On streets that have had previous overlays and not cold planed in accordance with this contract, the initial pull will be held 4" in from the edge of the gutter and then feathered to the edge of the gutter. This last point may differ from street to street and will be under the direction of the Engineer.
- d) If the street intersection has parallel cross gutters, resurfacing shall extend only to the near edge of the concrete where it shall be feathered.
- e) If the street has intersecting concrete cross gutters, they shall not be resurfaced. Asphalt shall be feathered at both edges of the concrete.
- f) In all cases, extreme care shall be taken to prevent blocking drainage.
- g) The Contractor shall unplug roof drains plugged by paving operations and shall rake asphalt into, or away from, existing driveways to provide smooth access and proper drainage to the gutter of the resurfaced street.
- h) Asphalt alley aprons abutting streets to be resurfaced shall be resurfaced to property line.
- i) When tack coating, no more surface shall be tacked than will be overlaid the same day.

- j) On streets with grade higher than 5%, the asphalt concrete laydown shall be placed uphill, unless impractical; the determination shall be made by the Engineer.
- k) Manholes, valve caps, or vaults existing in a City street to be resurfaced shall be windowed. (A small hole placed in the asphalt over the manhole, valve cap or vault).
- l) Contractor shall apply systemic herbicide to vegetation growing in pavement cracks, far enough in advance of resurfacing operations to kill existing growth.
- m) The Contractor shall treat any new weed growth with water-soluble contact herbicides, and remove all vegetation matter from the area to be resurfaced, as directed by the Engineer, or a minimum of 24 hours before applying the tack coat.
- n) A paving ski shall be required on all streets except for residential.
- o) The resurfacing shall consist of applying asphaltic concrete upon the existing roadbed at a varying thickness, and asphaltic concrete mix design as directed by the Engineer. Exact locations and type of asphaltic concrete will be listed and designated and areas will be outlined by the Engineer.

The resurfacing shall consist of applying asphaltic concrete upon the existing roadbed at a varying thickness, and asphaltic concrete mix design as directed by the Engineer. Locations and type of asphaltic concrete shall be as specified in the Supplementary Special Provisions. Areas will be as outlined by the Engineer.

Where the pavement slopes towards a concrete gutter, asphalt concrete shall be placed such that the pavement surface is $\frac{1}{4}'' \pm \frac{1}{8}''$ (6 mm \pm 3 mm) above the lip of gutter elevation. Where the pavement slopes away from a concrete gutter, asphaltic concrete shall be placed such that the pavement surface is flush with the lip of gutter elevation unless otherwise directed by the Engineer.

Unless otherwise specified, the first paving pass shall start at the low side of the crown of the street section, and successive passes shall proceed to the high side of the crown of the street section. This shall apply to both sides of the street section unless otherwise directed by the Engineer.

302-5.6.2 Density and Smoothness. ADD the following:

When a 10' (3 meter) straight edge is laid on the finished surface traverse to the centerline of the roadway, the surface shall not vary from the edge of the straightedge more than $\frac{1}{4}''$ (6mm), except at intersections or at changes of grade.

302-5.7 Joints. ADD the following:

Joints between longitudinal (parallel) passes shall be tack coated if the temperature of the preceding pass has cooled below 82° C (180° F).

The pinched joint method of rolling is to be used for rolling all asphalt concrete joints. The roller shall be employed in a longitudinal direction on the first pass of the breakdown roll with the roller entirely on fresh asphalt and 4" (100 mm) to 6" (150 mm) from the existing asphalt or concrete.

302-5.9 Measurement and Payment. ADD the following:

Payment for asphalt concrete and the required striping and pavement markers shall be included in the Bid item for asphalt concrete overlay and striping.

ADD: 302-5.10 Sand and Seal Coat. Asphalt concrete surfaces shall not be sand and seal coated unless otherwise specified. The sand and seal coat shall consist of a coat of asphaltic emulsion and a cover coat of sand. The asphaltic emulsion shall be mixing type conforming to 203-3 "EMULSION ASPHALT". Sand shall be clean and dry.

Immediately before applying asphaltic emulsion, the surface to be sand and seal coated shall be thoroughly cleaned of all dirt and loose material. Asphaltic emulsion shall not be applied when the street is overly wet or when the atmospheric temperature is below 50°F.

The asphaltic emulsion shall be applied by use of a power-spraying device that uniformly applies the emulsion to the surfacing at a rate of 0.1 to 0.15 gallon per square yard (0.45 L/m² to 0.7 L/m²). The distributor spray bar shall be equipped with asphaltic emulsion type spray jets. Curbs, gutters, other adjoining improvements shall be carefully protected from the emulsion, and any such improvements spattered or touched with emulsion shall be carefully cleaned.

Immediately after the application of asphaltic emulsion, a cover coat of sand shall be spread at the rate of 6 to 12 pounds per square yard (3.2 to 6.4 kg. per square meter). After the sand has been spread, any piles, ridges, or uneven distribution shall be broomed to maintain an even layer over the surface.

24 Hours after the seal coat has been applied, the surface shall again be broomed and any excess sand shall be picked up and removed from the job.

302-5.10.1 Measurement and Payment. Payment for sand and seal coat for asphalt concrete shall be included in the payment for asphalt concrete unless a Bid item has been provided for it. When a Bid item is provided for sand and seal coat, the unit of measurement shall be per square foot.

302-6.1 General. ADD the following:

Existing PCC pavement that is broken, displaced, and outside the trench limits as shown on the plans or as designated by the Engineer, shall be replaced by the Contractor in accordance with this subsection. After the necessary traffic control is in place and before any saw-cutting or equipment mobilizations, the Contractor shall meet with the Engineer and determine the limits of the existing pavement to be replaced. If the Contractor does not meet with the Engineer before removing displaced concrete, all replacement shall be at the Contractor's expense.

The edges of existing pavement for concrete replacement shall be saw cut to neat trimmed lines.

The thickness of the new concrete pavement shall be in accordance with Standard Drawing SDG-107 "Trench Resurfacing for Asphalt Concrete Surface Streets", SDG-108 "Trench Resurfacing for PCC Surface Streets" or both.

Prior to placing concrete, existing subgrade shall be prepared in accordance with 301-1, "SUBGRADE PREPARATION." If any existing unsuitable subgrade, as determined by the Engineer, is encountered it shall be replaced with imported backfill in accordance with 306-1.3.7, "Imported Backfill" prior to preparation.

302-6.8 Measurement and Payment. ADD the following:

The Bid item for Concrete Pavement Replacement shall include but not be limited to removal and disposal of existing pavement, subgrade preparation, saw-cutting existing edges, form work, placement and curing of concrete, placing class "F" asphalt, all labor, material, equipment and incidentals as required to construct concrete paving in accordance with the Plans and Specifications.

Payment for replacement of existing and previously disturbed pavement within the work area and outside the trench limits designated by the City of San Diego Standard Drawings shall be included in the Bid item for Concrete Pavement Replacement.

Payment for other disturbed pavement within the work area shall be considered included in the payment for the Work items causing the disturbance. This includes any pavement disturbed by a lack of adequate shoring in accordance with 306-1.1.7, "Shoring."

302-7.2.1 General. ADD the following:

Engineered paving mat shall be installed per manufacturer's recommendations while the asphalt tack is still liquid. Surface cracks over 1/4" (0.63 cm) shall be filled and brought to the level of the existing pavement surface. At the direction of the Engineer, irregular surface conditions shall be leveled by the use of a bituminous wedge or scratch course installed by hand or with the use of a mechanically powered asphalt-paving machine.

Mat shall be installed to the surface using mechanically powered installation equipment or by hand installed means. Mechanical equipment shall be capable of installing full width rolls of up to 12.5' (3.81 meters) in width. The installation by hand may also be used in situations where areas require specially cut sections, where mechanically installed methods cannot be accomplished, or both. Brooms or squeegees shall be used to remove any air bubbles and ensure paving mat is completely in contact with the tack-coated surface. If wrinkles occur, any wrinkle 1" (2.5 cm) inch shall be slit and lapped in the direction of paving and seated into the tack coat to insure adhesion.

Paving mat shall be overlapped to provide a minimum of 2" (5.1 cm) longitudinally and a minimum of 4" (10.2 cm) transversely. Overlaps on the transverse roll ends shall be in the direction of the paving operation to avoid paving mat pick-up during asphalt installation. All overlapping of paving mat shall be tack coated to ensure proper adhesion.

302-7.2.2.1 General. DELETE the first and second paragraphs and SUBSTITUE with the following:

Tack coat material and application rate shall be per manufacturer's recommendations. Tack coat shall be applied uniformly prior to placing fabric. The application rate may be adjusted as directed by the Engineer. Hand spraying shall be kept to a minimum.

Blotting the sealant, spreading sand or broadcasting bituminous asphalt mix over the paving mat shall be utilized to minimize and prevent construction and or paving tires/tracks from adhering to the tack coat and pulling up the mat. If the paving mat has been displaced from the surface, additional rolling and or hand-brushing shall be required to restore the bond between the surface and paving mat. An additional application of tack may be required to ensure adhesion. Additional tack coat or labor shall not be paid for as an extra and shall be considered incidental to the installation of the paving mat.

ADD: 302-8.4 Class F Asphalt Concrete Paving Deletion. Where asphalt concrete (AC) overlay is required, Class F asphalt concrete paving shown on Standard Drawing SDG-107, "Trench Resurfacing for Asphalt Concrete Surface Streets", shall not be used for trench resurfacing.

ADD: 302-13 CRACK SEAL WORK.

302-13.1 General. All cracks in asphalt 1/8" or wider shall be sealed prior to the application of slurry. The Contractor shall seal only transverse, longitudinal, block or reflective cracks. The Contractor shall not seal alligator (fatigue) cracked areas or cracks in PCC.

302-13.2 Materials. Crack sealant material used shall be Road Works 306, or CRAFCO Polyflex Type 3, or an approved equivalent. Sealant shall be prepared and applied to the pavement cracks in conformance with all manufacturers' instructions except where noted otherwise in this Specification.

302-13.3 Equipment. Cracks shall be cleaned using a hot compressed air lance (HCL) apparatus. Air exiting the lance shall be heated to a temperature sufficient enough to remove the oxidized surface from the crack walls.

The HCL shall meet the following specifications:

Compressed air capacity:	40 to 100 cfm, 75 to 150 PSI
Heated air temperatures:	600 to 2,200 °F
Exit heated air:	1,000 ft per sec.
Propane:	5 to 20 PSI

Prior to beginning work, the Contractor shall submit, to the Engineer, documentation certifying that each HCL apparatus to be used on the project meets the above specifications. If a delay in the start of Work exceeds 7 Working Days, re-certification is required and documentation shall be resubmitted.

302-13.4 Application. Cracks to be sealed shall be completely clean, dry, and free of all loose material, weeds and vegetation, and any other foreign substances which may cause the sealant not to adhere to the crack wall. The Contractor shall clean and dry all cracks with the HCL immediately before sealing.

Sealant shall be applied from the bottom of the crack up to the surface in a manner which does not result in sealant bridging or pockets of entrapped air. The sealant shall be applied to a slightly overfilled condition and then leveled with a squeegee. The width of sealant remaining on the surface shall exceed 1.5" on either side of the crack. Any debris blown onto adjacent gutters, sidewalks, parkways, medians, intersections or other areas shall be removed prior to the end of the working day.

302-13.5 Payment. Payment for Crack Sealing including weed spray, cleaning, and sealing shall be included in the other Bid items unless a Bid item unit price per linear foot has been provided for "Crack Seal."

SECTION 303 – CONCRETE AND MASONRY CONSTRUCTION

303-1.3 Forms. Eleventh paragraph, DELETE in its entirety and SUBSTITUTE with the following:

Exterior forms are required for structures unless otherwise specified on the Plans or in the Specifications.

303-1.8.4 Consolidating. ADD the following:

Rock pockets that in the opinion of the Engineer are detrimental to the steel reinforcement, the Engineer may allow the Contractor to repair in accordance with 303-1.9.2, "Ordinary Surface Finish."

303-5.1.1 General.

After the first paragraph, ADD the following:

Monolithic curb, gutter, and sidewalk shall not be allowed.

In areas where field adjustments to the curb and gutters may be required due to the existing conditions to maintain positive drainage, the Contractor shall contact the Engineer prior to the construction.

The Contractor shall exercise due caution when working around trees not to damage either the trunk or any of its limbs. If damage to a tree occurs, the contractor shall notify the Engineer. Once excavation has occurred, all efforts shall be made to mitigate the exposure of the tree roots to the air.

The Contractor shall complete the Work within 5 Working Days after demolition.

The Contractor shall be responsible for the restoration of the asphalt along the gutter line no sooner than 7 days after the placement of curb and gutter, but no later than 14 days.

Unless specified otherwise, when driveway is removed and replaced, the depressed curb and gutter shall be replaced monolithically with the driveway.

At the discretion of the Engineer, the angle of the new gutter shall be adjusted to maintain the existing grade or crown of the street and to avoid causing drainage problems. At the discretion of the Engineer, the height of the new curb shall be reduced to match existing conditions and create or maintain positive drainage away from the property line toward the curb. In areas where the curb height is being adjusted, the transition area shall be a minimum of 6'.

The Contractor shall neatly saw cut all damaged sidewalk, curb and gutter and roadway prior to their removal. The Contractor shall remove all PCC sidewalk, curb and gutter, and tree roots as directed and dispose of said materials at a legal disposal site. The Contractor shall remove any item which exists in the parkway area and will affect the final work product. The Contractor shall exercise due caution when working around trees not to damage either the trunk or any of its limbs. If damage to a tree occurs, the contractor shall notify the Engineer. Once excavation has occurred, all efforts shall be made to mitigate the exposure of the tree roots to the air.

The Contractor shall grade, compact the sub-grade, and form for new curb ramps, sidewalk and/or curb and gutter in accordance with these standard specifications. After final troweling, the PCC sidewalk shall receive a broom finish.

Once demolition has occurred on any site, the pouring of concrete shall be completed within 5 Working Days. The site and forms shall be inspected and approved by the Engineer prior to the pouring of concrete. Cleanup, dirt backfilling, and compaction at each job site shall be completed within 5 Working Days after the pouring and completion of sidewalk, curb ramps, gutter and curb replacement, and to the satisfaction of the Engineer. The Contractor shall be responsible for the back filling with clean dirt those areas adjacent to the sidewalk and curb that have been removed. The back fill material shall be compacted, and then adjusted to grade with the top of the new sidewalk and curb and gutter. Backfilling in sidewalk areas shall be included in the contract unit prices for PCC Sidewalk.

The Contractor shall be responsible for the restoration of the asphalt to acceptable conditions along the gutter line no sooner than 7 days after the pouring of curb and gutter, but no later than 14 days after placing concrete.

ADD: 303-5.1.4 Historical Stamps and Impressions. The Contractor shall remove and relocate the existing Contractor date stamp and Impression and street name stamps outside the pedestrian travel way to the parkway area or face of sidewalk. The stamp's position shall be such that it can be read from the street and as close as practical to the stamp's original location.

If it is determined that the date stamps or Impressions cannot be relocated or they are damaged and the Plans designate the stamps or impressions to be removed, the Contractor shall saw cut full depth at a minimum distance of 2" from the edge of the stamp, carefully remove, bag, label, and set it aside on Site in a location designated by the Engineer for pickup by others. The Contractor shall stamp, in concrete, the current Contractor's name and date.

ADD: 303-5.1.5 Existing Surface Improvements. If curb, gutter, or sidewalk are replaced, the Contractor shall duplicate the existing surrounding score pattern and color. The score pattern and color shall be approved in advance by the Engineer.

303-5.3 Placing Concrete. ADD the following:

The top and face of the finished concrete surfaces shall be true and straight, of uniform width and free of humps, sags, or other irregularities. The finished concrete surface shall not vary more than 0.02' (6 mm) from a 10' (3 meter) straight edge, except at grade changes or curves. No freestanding water will be permitted on slope over 1%. No freestanding water deeper than 1/16" (1.5 mm) will be permitted on slopes of less than 1%.

Concrete placed immediately before rain shall be protected to prevent rainwater from coming in contact with it. Sufficient protective covering shall be kept on hand at all times for this purpose.

303-5.4.2 Expansion Joints. Third paragraph, first sentence, REVISE to read:

Expansion joint filler ¼" (6mm) thick shall be placed in walk at the EC and BC of all walk returns, at 45' (13.5 meter) intervals in lieu of the regular weakened plane joint and around all utility poles which may Project into the concrete along the line of the work.

(a) General, Second paragraph; CHANGE "10' (3 meter)" to "15' (4.5 meter)".

Third paragraph; CHANGE "20' (6 meter)" to "15' (4.5 meter)".

303-5.5.3 Walk. ADD the following:

If the continuous sidewalk length equals a block or more, the name of the Contractor, together with the year in which the improvements is constructed, shall be stamped therein to a depth of ¼" (6mm) in letters not less than ¾" (19mm) high, at a location determined by the Engineer.

Once demolition has occurred on site, the placing of concrete shall be completed within 5 Working Days. The site and forms shall be inspected and approved by the Engineer prior to the placing of concrete. Cleanup and dirt backfilling of the job site shall be completed within 5 Working Days after the placing and completion of walk, and curb and gutter replacement.

The Contractor shall be responsible for the backfilling with clean dirt to the areas adjacent to the walk and curb that have been removed and replaced. The grade shall be adjusted to the new curb height. The backfill material shall be compacted to grade, with the top of the new walk and curb and gutter.

The Contractor shall prepare and distribute door hanger notices at least 72 hours in advance of beginning work at any location. Door hanger notices shall explain that damaged walk and curb and gutter will be removed and replaced. Door hanger notices shall include the Contractor's name and toll free 24 hour phone number. The Contractor shall coordinate with the residents prior to removing any driveways to allow time for cars to be relocated. Tow away signs shall include the same identifying information and shall be posted a minimum of 24 hours in advance of starting work.

The Contractor is required to coordinate with the root pruning activities, which may need to be done after the existing locations have been saw cut and removed, but before replacing the concrete. To facilitate efficient coordination, the Contractor is required to notify the Engineer of any revisions to the work schedule, at least one week prior to working in the affected areas.

303-5.5.5 Alley Intersections, Access Ramps, and Driveways. REVISE to read as follows:

Alley intersections, access ramps, and driveways shall be constructed as specified for concrete pavement in 302-6, "Portland Cement Concrete Pavement" except final finishing for alley intersections, access ramps and the sloping portion of driveways shall be done by hand with a steel trowel followed with medium coarse broom and the remaining portion of the driveway finished as specified for walks in accordance with 303-5.5.3, "walk."

303-5.6 Curing. Third paragraph, second sentence, ADD the following:

"...bituminous pavement or cement treated base adjacent to concrete curb..."

303-5.9 Measurement and Payment. Add the following:

Payment for Contractor date stamps and impressions shall be made at the Contract unit price bid for Contractor Date Stamps and Impressions.

The payment for replacing the depressed curb and gutter in a driveway shall be included in the Contract unit price for Concrete Driveway.

Payment for removing tree roots, cutting, excavation, disposal, import and backfilling to grade, and pavement construction shall be included in the items of Work for which the subgrade is prepared.

At locations where the width of the walk is being reduced, payment for removing the existing walk shall be included in the Contract unit price bid for "Remove and Replace Existing Sidewalk."

Additional curb and gutter removal, disposal and replacement are required adjacent to Work on a proposed curb ramp as directed by the Engineer. Payment for the additional removal, disposal and replacement of curb and gutter shall be included in the Bid item for "Additional Curb and Gutter Removal and Replacement." Payment for additional sidewalk removal and replacement shall be included in the Bid item for "Additional Sidewalk Removal and Replacement."

Measurement shall be made of actual areas and depths authorized by the Engineer, calculated as cubic yards in place. Excavation, grading, and backfilling shall be included in the unit price bid for sidewalk, curb ramps or curb and gutter respectively.

303-5.10 Curb Ramp Construction.

303-5.10.1 Installation. Prior to Bid, the Contractor shall evaluate the Site to determine existing conditions and actual limits of work to assure the installation of compliant curb ramp(s). The Contractor shall obtain the Engineer's approval of the layout of the curb ramp prior to construction.

If the condition of the street and sidewalk is such that the existing slopes do not allow the installation of the required curb ramp and side/flare slopes then the Contractor may extend the construction of the slope up to a maximum length of 15'-0" (linear feet) to catch the required slope even if the required slope is not achieved. Close coordination with the designated Engineer is required at these conditions prior to any demolition of the street and sidewalk and prior to the installation of the curb ramp.

To allow for proper drainage, the slope of the landing to the street shall not be less than 1.0%. The slope of the ramp shall not exceed 1 unit vertical to 12 units horizontal or 8.33%. The slope of the sides and flares shall not exceed 1 unit vertical to 10 units horizontal or 10.0%.

The DWT shall be installed in accordance with the manufacturer's specifications by installer certified in writing by Supplier.

The DWT shall be oriented such that the rows of domes are parallel with the direction of the ramp. When multiple tiles (regardless of size) are used, the domes shall be aligned between the tiles and throughout the entire detectable surface installation. The edge of the tile(s) nearest the street shall be between 6" and 8" from the gutter flow line. The Contractor shall trim and refinish edges of trimmed tiles in accordance with manufacturer's recommendations. Field trimming of stainless steel panels shall not be allowed.

The DWT shall be used as shown on the Plans. The Contractor may not change the material specified without the written approval of the Engineer. Failure to adhere to this specification shall result in the rejection of the Work.

The Contractor shall submit an approved TCP, including a pedestrian access plan through the construction zone with approved signage, in accordance with 2-5.3, "Submittals." The Contractor shall not replace more than two curb ramps in one intersection at the same time, and shall only

demolish those curb ramps that can be replaced within 2 consecutive Working Days in the same week.

303-5.10.2 Payment. Payment for curb ramps shall include DWT, demolition and disposal, forming, relocating or raising to grade items in conflict, protecting and preserving existing survey monuments, restoring pavement, and traffic control.

Additional concrete sidewalk and curb quantities will be paid for in accordance with the Contract unit price for additional curb and additional sidewalk.

ADD: 303-6.1.1 Stamped Concrete Pavement. Stamped concrete pavement shall be constructed in accordance with the following conditions:

- a) Prior to construction, a test section at least 5'x5' shall be approval of the test section, it will be designated as the standard for that particular pattern on the subject Project. In case of dispute, testing may be required by either ASTM E-274 or California Test Method No. 342, with a minimum acceptance value of 0.35 for both tests.
- b) Visual inspection of Work shall be performed to determine that surface texture is as rough as the approved test section and the surface flatness is as flat as the approved test section.
- c) In the event of rejection of a completed pavement area, the Contractor shall have the opportunity to rework the rejected area to meet requirements.
- d) Concrete color and method of application shall conform to 303-7, "COLORED CONCRETE."
- e) Coloring and curing compounds used in the work shall be from the same manufacturer and batch lot.
- f) The thickness of the concrete paving shall be increased by one-half inch (1/2") over that which is required for Schedule "J" paving (SDG-113).
- g) The pavement section shall be PCC, Class 560-C-3250, placed in accordance with 302-6, "PORTLAND CEMENT CONCRETE PAVEMENT."
- h) There shall be no cold joint between the structural PCC pavement section and the stamped surface layer. The stamped surface layer shall not be less than 4 inches thick.
- i) The final finishing for textured, stamped or colored concrete paving shall be in accordance with 302-6.4.4, "Final Finishing" subject to the following conditions:
 - i. Stamping will be performed before the initial set of the concrete. No water shall be added to the surface.
 - ii. A flat surface shall be maintained. No rounding shall be allowed.
 - iii. Limited to a running bond pattern.
 - iv. 1/4" wide maximum groove –1/4" deep maximum imprint.
 - v. Portland cement concrete shall not be placed in air temperature exceeding 85° F.
 - vi. A very heavy broom finish, perpendicular to the traveled way, shall be used.
 - vii. No wax curing or wax sealing is permitted.

303-6.1.1 Measurement and Payment. Stamped concrete pavement will be paid for at the Contract Unit Price. If no Bid item has been provided, payment shall be included in the various Bid items.

ADD: 303-7.5 Measurement and Payment. The payment for Colored Concrete shall include the additional costs associated with adding color to each cubic yard of concrete. The payment for the concrete work shall be included in the applicable Bid items of work requiring colored concrete e.g., concrete curbs, walks, walls, gutters, cross gutters, alley intersections, access ramps, and driveways.

SECTION 304 – METAL FABRICATION AND CONSTRUCTION

304-5 Payment. The payment for street name signs complete, including footing, post, sign and all required hardware shall be included in various Bid items.

SECTION 306 – UNDERGROUND CONDUIT CONSTRUCTION

306-1.1.6 Bracing Excavations. ADD the following:

Shoring is considered to be adequate sheeting, shoring, bracing, or equivalent method for (1) protection of life and limb which shall conform to applicable safety orders; (2) protection of existing underground and above-ground private and public improvements; and (3) the remedy of any and all conditions encountered, regardless of depth, (including, but not limited to trench sloughing, pavement separation, etc.) during the construction of the Project.

The Contractor shall take appropriate measures when trenching adjacent to the existing utilities, i.e., sewer and water mains, storm drain, and conduits to prevent the existing utility trench from sloughing into the new trench excavation. The wall of the new trench may be adjacent to the edge of the existing trench and therefore may contain loose material. The Contractor is required to use adequate shoring or other protective construction measures as required by field conditions to prevent damage to pavement outside the trench width and to prevent sloughing of the trench wall.

The Contractor shall be responsible for any sloughing and damage to the road surface or other utilities that may occur. It shall be the Contractor's responsibility to repair any damaged pavement or utilities as a result of the sloughing.

Fourth and fifth paragraphs, DELETE in their entirety and SUBSTITUTE with the following:

At locations where the drilling of such holes is impracticable because of the existence of rocks, running sand, or other similar conditions, and provided said impracticability is demonstrated to the satisfaction of the Engineer by actual drilling operations by the Contractor, the Engineer may, upon request of the Contractor, approve the use of means other than drilling for the purpose of placing the vertical support. Such other means shall not damage existing surface or subsurface improvements, both public and private.

If sheeting is used to support the excavated trench, the sheeting shall not remain in the trench and shall be removed. When field conditions makes the removal of sheeting impractical as determined by the Engineer, the Engineer may permit portions of the sheeting to be cut off to a specified depth and remain in the trench.

The Bid item for shoring shall include full compensation for furnishing, installing, maintaining, and removing all sheeting, shoring, or bracing, for any conditions encountered that require shoring, and no additional payment will be allowed therefore.

306-1.2.1.1 General. ADD the following:

When jetting, care shall be exercised to avoid floating of the pipe.

For PVC water pipes, sand equivalent shall be SE 50. SE 30 or higher may be substituted for SE 50 as bedding material if:

- a) the top of the pipe and haunch areas are mechanically compacted by means of tamping, vibrating roller or other mechanical tamper,
- b) equipment is of size and type approved by the Engineer, and
- c) 90% relative compaction or better is achieved,

PVC sewer pipes shall be bedded in 3/8" crushed rock in accordance with 200-1.2, "Crushed Rock and Rock Dust."

The bedding material shall either be sand, crushed aggregate or native free-draining granular material. 100% of the bedding material shall pass the no. 4 sieve, shall have a sand equivalent of not less than 50 and an expansion when saturated with water of not more than 0.5%.

For storm drains and all types of non-PVC sewer mains, 3/4" (19 mm) crushed rock in accordance with 200-1.2, "Crushed Rock and Rock Dust" shall be placed to a depth of 4" (100 mm) below the outside diameter of the pipe or one inch below the bell of the pipe, whichever is greater.

306-1.2.1.3 Bedding for Plastic Pipe and Fittings. ADD the following:

CLSM shall be used for bedding and backfilling when HDPE pipe is installed in paved areas, where pipe crosses utility easement, and at locations where pipe is to be backfilled with concrete as shown on the Plans. CLSM shall conform to 201-6, "Controlled Low Strength Material (CLSM)" and the following concrete classes or as designated in the Contract Bid item or shown on the Plans:

- a) 190-E-400 in residential and local streets.
- b) 380-E-800 in major and arterial streets.

The concrete backfill shall be placed in the trench against undisturbed material at the sides and bottom of the trench and in a manner that will prevent floating or shifting of the pipe, and voids in, or segregation of, the concrete. Foreign material which falls into the trench, prior to or during placing of the concrete, shall be immediately removed. Where necessary, earth plugs shall be constructed and compacted at the ends of the planned concrete backfill to contain the concrete within the trench.

The surface of the concrete backfill shall be broomed with a heavy broom to produce a uniform rough surface if asphalt concrete is to be placed directly thereon.

No material shall be placed on top of the concrete backfill until 24 hours after placing the concrete backfill.

ADD: 306-1.2.1.4 Irrigation Pipe Bedding Material. The bedding material shall be SE 50, plaster, or mortar sand per Section 200.1.5, "Sand" for irrigation pipe, direct burial control wire, and electrical conduit.

306-1.2.6 (d) Flanged Joints and (e) Mechanical Joints. ADD the following to both subsections:

Joints and mechanical couplings and nuts and bolts shall be field wrapped with a 3 part wax-tape coating system per AWWA C217.

306-1.2.12.1 General. DELETE the notes associated with Table 306-1.2.12.1(A) and SUBSTITUTE with the following:

- a) 30 days after Installation and prior to paving.
- b) Deflections of up to 6.5% of the in-field measured diameter are acceptable for storm drain applications.
- c) Inward bell shaped deflection in the pipe barrel shall not be allowed.

- d) Deflection tests shall not be performed sooner than 30 days after completion of placement and compaction of backfill. The pipe and fittings shall be cleaned and inspected for offsets and obstructions prior to testing.

306-1.2.13 Installation of Plastic Pipe and Fittings. ADD the following:

The following installation requirements apply to the use of HDPE pipe:

- a) Pipe shall be installed where shown on the Plans in accordance with ASTM D2321, these specifications, and the manufacturer's specifications. In the case of a discrepancy, the more restrictive requirements shall govern.
- b) Pipe shall be laid in a trench excavated to the lines and grades established by the Engineer. The bottom of the trench shall be graded and prepared to provide a firm and uniform bearing throughout the entire length of the pipe.
- c) The minimum horizontal clearance shall be 5' as measured from the outside diameter-to-outside diameter.
- d) Pipe, pipe couplings, and accessories shall be unloaded, stockpiled, hauled, distributed, and otherwise handled in a manner which will prevent damage to the materials.
- e) Special care shall be taken to install pipe to exact grade and line. Pipe, when jointed, shall form a true line of flow. Any pipe that has a grade or joint disturbed after installation shall be removed and reinstalled.
- f) Pipe shall be installed with the separate sections joined firmly together, with outside laps of circumferential joints pointing upstream, and the center line of the invert coinciding with the specified alignment of the pipe.
- g) The interior surfaces of pipes shall be thoroughly cleaned of foreign matter before being lowered in the trenches and shall be kept clean during laying operations.
- h) Pipe shall be laid and jointed in accordance with generally accepted practice and the following provisions in order to be suitable for the purpose intended.
- i) Necessary facilities shall be provided for lowering and properly placing the sections of pipe in the trench.
- j) Pipe shall be laid to line and grade with the sections closely jointed.
- k) Every precaution shall be taken to prevent flooding the pipe trench before backfilling operations.
- l) The last two standard pipe sections at each opening shall be reinforced concrete pipe (RCP) installed in accordance with manufacturers' requirements. In the case of a discrepancy, the more restrictive requirements shall govern.
- m) New plastic pipe shall be connected to existing or new drainage facilities as shown on the Plans. When concrete collars or "tee" connections are required to connect new plastic pipe to existing or new pipe, the concrete collars or "tee" connections shall be constructed of minor concrete conforming to the provisions in Caltrans Standard Specifications, Section 90-10, "Minor Concrete." Reinforcement for the concrete collars or tees shall conform to the provisions in Caltrans Standard Specifications, Section 52, "Reinforcement."

ADD: 306-1.2.14 Thrust Blocks and Anchor Blocks. Thrust blocks and anchor blocks shall be constructed per information included in the SSP **as an appendix.**

306-1.3.1 General. Eleventh paragraph, ADD the following:

Native material shall be unacceptable for trench backfill when:

- a) The Contractor has attempted compaction and demonstrates through testing that the soil is not compactable in the native state;
- b) is not dryable, as further required, by finding of a sand equivalent of less than 15, or more than 15% passing the 200 sieve; and
- c) when either of the following values are exceeded:
 - i. Liquid Limit 50
 - ii. Plasticity Index 20

The Engineer shall have the authority to require further testing when, in the opinion of the Engineer, the nature of the native material has changed in either moisture content or ability to be dried.

306-1.4.4 Air Pressure Test. Fifth paragraph, ADD the following:

For PVC sewer mains, minimum gauge pressure, test duration, acceptance requirements, and gauge certification shall be in accordance with 306-1.4.4.1, "Air Pressure Test for PVC Sewer Mainlines."

306-1.4.4.1 Air Pressure Test for PVC Sewer Mainlines. After laying, backfilling and compacting sewer lines, they shall be air pressure tested by the Contractor. For sewer main replacement where live laterals are connected to the new main, air pressure testing shall not be required.

The test section shall be pressurized to 3.5 psi (24.1 kPa) and shall be held above 3.0 psi (20.7 kPa) for not less than 5 minutes. Air shall be added if necessary to keep the pressure above 3.0 psi (20.7 kPa).

When the prevailing groundwater is above the pipe being tested, air pressure shall be increased 0.43 psi (3 kPa) for each foot the water table is above the invert of the pipe.

The pressure gauge used shall be supplied by the Contractor, shall have minimum divisions of 0.1 psi (0.7 kPa) and shall have an accuracy of 0.04 psi (0.3 kPa). A certified testing shall certify accuracy and calibration of the gauge firm annually or when requested by the Engineer.

At the end of the 5 minute saturation period, note the pressure shall be 3.0 psi (20.7 kPa) minimum and begin the same lapse required for air pressure drop. If the pressure drops more than 0.5 psi (3.4 kPa) in less than the time shown in Table 306-1.4.4.1 (A), the section of pipe is deemed to have failed the test.

TABLE 306-1.4.4.1 (A)

1 Pipe Dia (in/cm)	2 Min Time (min.sec)	3 L for Min Time (ft/m)	4 Time For ADD'l L(sec) x L	Specification Time for Length (L) Shown (min sec)							
				100 ft. 30.5 m	150 ft. 45.7 m	200 ft. 61.0 m	250 ft. 76.2 m	300 ft. 91.4 m	350 ft. 106.7 m	400 ft. 121.9 m	450 ft. 137.2 m
4/ 10.16	1.53	597/ 181.97	0.190 x L	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6/ 15.24	2.50	398/ 121.31	0.427 x L	2:50	2:50	2:50	2:50	2:50	2:50	2:51	3:12
8/ 20.32	3.47	298/ 90.83	0.760 x L	3:47	3:47	3:47	3:47	3:48	4:26	5:04	5:42
10/ 25.40	4.43	239/ 72.85	1.187 x L	4:43	4:43	4:43	4:57	5:56	6:55	7:54	8:54
12/ 30.48	5.4	199/ 60.66	1.709 x L	5:40	5:40	5:42	7:08	8:33	9:58	11:24	12:50
15/ 38.10	7.05	159/ 48.46	2.671 x L	7:05	7:05	8:54	11:08	13:21	15:35	17:48	20:02
18/ 45.72	8.30	133/ 40.54	3.846 x L	8:30	9:37	12:49	16:01	19:14	22:26	25:38	28:51
21/ 53.34	9.55	114/ 34.75	5.235 x L	9:55	13:05	17:27	21:49	26:11	30:32	34:54	39:16

1 Pipe Dia (in/cm)	2 Min Time (min.sec)	3 L for Min Time (ft/m)	4 Time For ADD'l L(sec) x L	Specification Time for Length (L) Shown (min sec)							
				100 ft. 30.5 m	150 ft. 45.7 m	200 ft. 61.0 m	250 ft. 76.2 m	300 ft. 91.4 m	350 ft. 106.7 m	400 ft. 121.9 m	450 ft. 137.2 m
24/ 60.96	11.20	99/ 30.18	6.837 x L	11:24	17:57	22:48	28:30	34:11	39:53	45:35	51:17
27/ 68.58	12.45	88/ 26.82	8.653 x L	14:25	21:38	28:51	36:04	43:16	50:30	57:42	46:54
30/ 76.20	14.10	80/ 24.38	10.683 x L	17:48	26:43	35:37	44:31	53:25	62:19	71:13	80:07
33/ 83.82	15.35	72/ 21.95	12.926 x L	21:33	32:19	43:56	53:52	64:38	75:24	86:10	96:57
36/ 91.44	17.00	66/ 20.12	15.384 x L	25:39	38:28	51:17	64:06	76:55	89:44	102:34	115:23

For larger diameter pipe use the following formula: Minimum time in seconds = 1.2 x diameter in mm.

306-1.4.5 Water Pressure Test. ADD the following:

Testing of the completed pipeline shall be performed in sections between test bulkheads after all anchors and appurtenances have been installed, and backfilling completed. The Contractor shall install the test bulkheads at locations approved by the Engineer. Pressure test against closed valves shall not be allowed.

Test pressure of pipe and fittings at the lowest elevation shall be 150% of pipe pressure classification and no less than 100% of pipe pressure classification at the highest elevation.

Side outlets valves to be furnished with blind flanges shall be tested uncovered to allow visual inspection for valve leakage during the required field hydrostatic test.

An optional field hydrostatic test may be permitted by the Engineer. The duration of the test shall be 1 hour with pumping discontinued at specified pressure.

In the event that the rate of loss of water during either test method exceeds the acceptable rate, the Contractor shall locate the leaks and perform the required repairs. Regardless of the outcome of the test, all detectable leaks shall be repaired by the Contractor at its own expense. Additional test shall be performed until a satisfactory test has been completed. The connections to existing pipelines shall be tested at line pressure after refilling the existing pipelines. The Contractor shall repair all leaks in the connections which occur as a result of testing operations.

No leakage is allowed for steel (flanged or welded) and ductile iron (flanged) pipe. The Contractor shall provide accurate means for measuring the quantity of water lost. The allowable leakage shall be 15 gallons per inch (2.25 liter per mm) of diameter per mile of pipeline in accordance with 24 hours.

ADD: 306-1.4.7 Disinfection and Testing. New water mains shall be disinfected and tested in accordance with AWWA C651 and State Health Department requirements. The City will perform a chlorine residual test prior to flushing and a bacteriological test after flushing. No main shall be placed in service until the results of the bacteriological tests are announced as satisfactory.

ADD: 306-1.4.8 Televising Sewer Mains and Storm Drains.

306-1.4.8.1 General. The Contractor in coordination with the Engineer shall televise new sewer mains and storm drains, and existing sewer mains when performing parallel replacement to locate existing laterals. The Contractor shall provide the video records (with compressed audio) in digital file format on digital video discs (DVD's).

- a) The Contractor shall provide an initial submittal at the start of televising work demonstrating the typical video and audio quality to be provided for acceptance by the Engineer. This submittal shall note any proposed changes to the specification listed below regarding video format, data processing, compression or other conditions.
- b) The Engineer shall be notified a minimum of 2 Working Days in advance of televising. The entire televised inspection process shall be done in the presence of the Engineer.
- c) When televising existing mains, the Contractor shall provide the televising DVD(s) and a red-lined set of Plans showing the location of the existing laterals to the Engineer before constructing the new sewer mains.
- d) New sewer mains shall be inspected by CCTV and recorded on DVD not less than 22 working days after completion of permanent trench restoration and/or finished grading, but prior to final resurfacing.
- e) Ten Working Days shall be allowed for the Engineer to review each individual DVD of each main documented on that particular DVD. In the event that any deficiencies or sags are discovered by the Engineer, either by the Contractor's televising or the City's re-televising, 5 Working Days shall be allowed for the Engineer to decide if the deficiencies or sags are repairable, in place. The Contractor shall not be entitled to Contract Time extension due to delays resulting from correcting deficiencies or sags as determined by televised inspections.
- f) The City reserves the right to re-televising any new sewer main after the placement of permanent trench restoration and before final acceptance to determine the existence and extent of any foreign material or obstructions such as cement grout, wood, rocks, sand, concrete, or pipe fragments, and any structural deficiencies, or sags precipitated by the permanent trench restoration operations or other items of Work.
- g) Televising shall be done in one direction for the entire length between manholes. Each section shall be isolated from the remainder of the sewer line or storm drain as required. Sufficient water shall be supplied to the isolated section to cause drainage reaching the downstream manhole prior to televising.
- h) In the event that the existing flow is interfering with the video operation, a bypass shall be performed by the Contractor to lower the flow volume sufficiently to allow for a clear video picture.
- i) The Contractor shall clean the sewer mains prior to televising as necessary to adequately perform the video operations.
- j) The Contractor shall review the DVD for any discrepancies or deficiencies in the installation of the pipe.

306-1.4.8.2 Video Operator Qualifications. The video operator shall have at least 1 year of experience with a project of a similar nature within the last 3 years.

306-1.4.8.3 Equipment for Televising. Camera and lighting quality shall be suitable to provide a clear, continuously in-focus picture of the entire inside periphery of the sewer pipe or storm drain for all conditions encountered during the work. The remote reading footage counter shall be accurate to within 0.5% over measured distance of the particular section being inspected and shall be displayed on the television monitor. The equipment shall be capable of televising the entire length from manhole to manhole in one direction. When televising storm drains or sewer mains the camera shall be capable of scanning the joints for 360°.

306-1.4.8.4 Televising Procedures. The camera shall be moved through the line at a uniform rate, stopping when necessary to ensure proper documentation of the condition of the sewer line but in no case shall the television camera be pulled at a speed greater than 30' (9 meter) per minute. The importance of accurate distance measurements is emphasized. Measurement for location of defects shall be above ground by means of a measuring device. Footages shown on the DVD(s) shall coincide with horizontal lengths from stationing as shown on the plans. Footage measurements shall begin at the centerline of the upstream manhole or storm drain access point, unless permission is given by the Engineer to do otherwise.

306-1.4.8.5 DVD Requirements.

- a) DVD recordings shall be in color and in MPEG2 format. The minimum video bit rate shall be 4.7 Mega bits per second (Mbps) and minimum audio bit rate shall be 128 Kilo bits per second (Kbps). Out-of-focus video recording or low quality and blurred pictures due to steam or smudged camera lens, or portions thereof, shall be cause for rejection of the video recording.
- b) The camera source image capture shall provide image with a minimum of 640 x 480 pixels capture. The video shall be at least 30 frames per second.
- c) Audio and written documentation shall accompany all DVD(s) submitted to the Engineer. One file shall be provided for each manhole to manhole pipe segment.
- d) Each DVD submittal shall include the following:

Visuals

- 1. Adequate view of the upstream and downstream manholes or storm drain access points.
- 2. A pause at and zoom in on the lateral connections sufficient for identification of the condition of the connection.
- 3. A pause at and zoom in on the indentified defects sufficient for identification of the type of problem.
- 4. Each pipe section shall be identified by end manhole numbers, station numbers, sheet number and the street name. If shown on the Plans, Facility Sequence Numbers (FSN) can be used in lieu of manhole and sheet numbers.
- 5. A continuous read-out of the camera distance from the starting manhole to the end point at all times.

Audio

- 1. Date of CCTV inspection.
- 2. Confirmation of each section to be CCTV inspected (narrative of manholes, storm access points or station numbers, or FSN's) and direction (upstream/downstream).
- 3. Description of pipe size, material and pipe joint length.
- 4. Description and location of each defect.
- 5. Description and location of each service connection.
- 6. Include brief but informative comments on data of significance, including, but not limited to, the locations of unusual conditions, type and size of connection, collapsed section, the presence of scale and corrosion, and other discernible features.

Written Documentation

1. Date of CCTV inspection.
2. Printed labels on DVD number, location information, date of inspection, and other descriptive information.
3. Location, size, material, and length of pipe.
4. Direction of flow and measurement ("From" manhole or storm drain access point or station number "To" manhole or storm drain access point or station number or FSN).
5. File numbers itemizing individual segments.
6. Sketch showing the street and cross streets where the CCTV inspection was made.
7. Description and location of each defect or deficiency and a list of all proposed repairs.
8. Description and location of each connection.
9. A menu which lists files for each pipe section to be inspected and the date of the inspection.

306-1.4.8.6 Tolerances. For underground sewer or storm drain conduit installations, the maximum operational tolerance for sag shall be 1/2". When televised inspection is used to check for sag, a calibrated 1/4" diameter steel bar, mounted in front of the camera, shall be used to measure the depth of sag.

306-1.4.8.7 Payment for Televising Sewer Mains and Storm Drains. The payment for cleaning and televising sewer mains and storm drains shall be included in the unit price Bid items for televising sewer mains and storm drains. If a Bid item has not been provided, the payment shall be included in the payment for pipe installed.

ADD: 306-1.4.9 Balling Sewers. Prior to acceptance by the Engineer, the Contractor shall demonstrate that new sewer mains are clear of obstructions. The Contractor shall use a Wayne ball in the Engineer's presence. A trap basket shall be required at the downstream end of main to prevent debris from entering the City's sewer systems.

306-1.5.1 Temporary Resurfacing. Last paragraph, DELETE in its entirety and SUBSTITUTE with the following:

Payment will be limited to the quantity placed as approved by the Engineer and shall include material used to maintain the temporary resurfacing until the permanent resurfacing is placed. Material which is placed by the Contractor for its convenience shall be at no cost to the City.

ADD the following:

Temporary trench resurfacing and subgrade shall be compacted with 1½ Ton roller. Trench plating shall not be allowed for more than 24 hours at any location.

306-1.5.2 Permanent Resurfacing. DELETE in its entirety and SUBSTITUTE with the following:

A paving machine or spreader box shall be used to place the Class "F" asphalt concrete wearing surface, followed immediately by a roller. Resurfacing shall be completed within a maximum of 30 days after traffic is restored.

The Contractor shall be responsible for removal and replacement of all permanent paving damaged due to exposition, repair and replacement of the pipe which has failed testing. The Contractor shall not be entitled to any additional Working Days due to delays resulting from removal and replacement of permanent paving due to test failure.

306-1.6 Basis of Payment for Open Trench Installations. Second paragraph, REVISE to read as follows:

Third paragraph, after the word "backfill" ADD: "disposal of all excess excavation,"

ADD the following:

The Bid item for Imported Backfill shall include the payment for disposal of unsuitable excavated materials.

Payment for thrust blocks and anchor blocks for water mains 10" or smaller shall be included in the Bid item for water main.

Payment for thrust blocks and anchor blocks for water mains larger than 10" shall be included in the Lump Sum Bid item for water main thrust blocks and anchor blocks.

Payment shall be included in the various Bid items unless a pay item has been provided for Meter Assembly. The concrete pad, fence, gate, associated piping, and coordination with City Forces shall be included in the payment for the meter assembly.

The payment for valves, fire hydrant assembly and marker, fire service assembly, fire service connection, and backflow preventer shall be included in the unit price Bid items for Valves, Fire Hydrant Assembly and Marker, Fire Service Assembly and backflow preventer, Fire Service Connection, and Backflow Preventer.

Removal of existing Fire Hydrant and all appurtenant work shall be included in the Bid item for Fire Hydrant and Assembly and Marker.

The payment for underdrains shall be included in the unit Bid item for "Underdrains."

The quantity of filter fabric to be paid for will be measured in yd² of the area covered, not including additional fabric for overlap. The quantity of permeable material to be paid will be measured by tons.

ADD: 306-1.7 House Connection Sewer (Laterals) and Cleanouts. Such a connecting sewer is commonly known as a sewer lateral or sewer service lateral and may be so identified.

Laterals shall be replaced and shall include a cleanout at property line. The Plans show the approximate location of the laterals. Connections shall be made using a "wye" cut-in. Saddle connections shall not be permitted.

One lateral and cleanout shall serve the homes or buildings for only 1 lot. In the event 2 or more lots are served by the same lateral, the Contractor shall provide each additional lot with its own lateral and cleanout.

If the "wye" is in the public right-of-way, each lot shall be reconnected to a new and separate lateral and shall include separate cleanouts. If the "wye" is out of the public right-of-way, the lots shall be reconnected to a new lateral with a cleanout. A stub-out with a cleanout shall be provided to the property line for future reconnection.

Lateral records are available to the Contractor for inspection at Public Utility Department, Maps & Records, (619) 527-7482.

If the proposed sewer main alignment is in a different location than the existing main or the proposed laterals are at a different angle than the existing laterals, the Contractor shall locate the laterals by using a remote locating device, potholing existing laterals to be connected to the new sewer main, or both.

New laterals shall be perpendicular from the new sewer main. The Contractor shall determine the exact location of the lateral at the property line prior to the installation of the new main and install the corresponding wyes at these locations.

Replacement laterals shall be the same size as the existing; the minimum diameter for a lateral and cleanout is 4".

Concrete base shall be required only for a Vitrified Clay Pipe lateral if the vertical drop is 6' or greater. Concrete base shall not be required for PVC or ABS laterals.

The Contractor shall ensure that sewer laterals have been successfully connected to the new sewer mains and that water tight capping or plugging has been completed before abandoning any existing sewer mains. The Contractor shall plug the existing sewer main that is identified on the Plans to be abandoned, at a downstream location approved by the Engineer.

The Contractor shall monitor it for a 48-hour period to ensure that there is no flow in the existing main. If there is flow in the existing main, Contractor shall perform dye pack testing to determine which lateral remains connected and repeat the 48-hour test once it is replumbed.

306-1.7.1 Payment. The payment for constructing new laterals and cleanouts shall be included in the Bid item for Sewer Lateral. Payment for plugging, monitoring, and testing shall be included in the Bid item for new sewer main. Payment for lateral connection shall be included in the price of the main if a separate Bid item is not provided.

306-1.7.2 Sewer Lateral with Private Replumbing. Where sewer laterals with private replumbing are shown on the Plans, the Contractor shall install a new sewer lateral and new private sewer pipes and connect the new pipe to the private house plumbing. The Work shall be performed by a qualified licensed contractor in accordance with current building and plumbing codes.

306-1.7.2.1 Location. The location and details of replumbing work shown on the Plans are approximate. The Contractor shall locate sewer laterals by using a remote locating device, potholing existing sewer laterals, or both for connection to the new sewer main. The alignment for each new connection shall be selected such that the required length of pipe and disturbance to private property are minimized.

Prior to any sewer lateral replumbing construction activity, the Contractor shall coordinate with the property owner and arrange for video recording pre-existing conditions of the property in accordance with 7-9.1, "VIDEO RECORDING OF PRE-EXISTING CONDITIONS."

306-1.7.2.2 Permits. It shall be the Contractor's responsibility to pay for, obtain, and get approval for any required permits for the Work to be done on private property. Submittal of the approved permits shall be a condition of Final Payment for each location.

The City has obtained the executed replumbing agreements with the property owners for this project. A copy of the agreements may be obtained from the City's Project Manager. The Contractor shall meet with the property owner and the Engineer prior to any work and coordinate the details of the installation at each location. The Contractor shall notify the property owner a minimum of 10 Working Days before beginning Work on private property.

306-1.7.2.3 Submittals. Prior to any sewer lateral replumbing construction activity, the Contractor shall submit a separate Working Drawing of the new connection for each property to the Engineer in accordance with 2-5.3, "Submittals." Working Drawings shall include a Plan and profile showing existing size and type of material to be used and point of connection to the existing property plumbing. Each Working Drawing submittal shall include a written approval by the property owner including an acknowledgement that the property owner has been provided a copy of the Working Drawings by the Contractor including any as-built conditions.

306-1.7.2.4 Trenchless Construction. Trenchless methods shall be used for installation if the sewer lateral location intersects existing structures or as noted on the Plans. The following requirements shall apply:

- a) Pipes used for private replumbing shall be a minimum of 4" in diameter and shall conform to Section 207, "Pipe."
- b) Sewer lateral cleanouts shall be constructed at the connections to the house plumbing and at every bend on private property.
- c) The construction schedule for each replumb shall be arranged to minimize the disruption to the property owner.
- d) The Contractor shall ensure 2% fall, avoid existing utilities, foundation and maintain alignment within the property boundary while meeting the end connection. The borehole diameter shall not exceed the pipe diameter by more than 2".
- e) Submittal Requirements:
 - i. The proposed method shall be submitted for approval in accordance with 2-5.3, "Submittals."
 - ii. Address and schedule of sewer lateral replumbs to be tunneled.
 - iii. Launch and receiving pit locations for each sewer lateral replumbs to be tunneled and shaft dimensions.
 - iv. Proposed drill path alignment (both horizontal and vertical) for each sewer lateral replumbs to be tunneled.
 - v. Pipe physical properties and specifications. Calculations indicating that the method/process used does not exceed the allowable tensile and compression limits of the pipe.
 - vi. Jacking forces and factor of safety.
 - vii. Tunnel diameter.
 - viii. Minimum depth of cover for each sewer lateral replumbs to be tunneled.
 - ix. Construction procedure and operation sequence.
 - x. A list of the completed projects and staff experience shall be included in the submittal.
 - xi. Tunneling equipment and grade control methods.
 - xii. Certification that the tunneling method shall be able to achieve the tolerances; if listed in these specifications.
 - xiii. If drilling fluid is used, viscosity, density, and composition of drilling fluid.
 - xiv. If drilling fluid is used, method of slurry containment and disposal.

306-1.7.2.5 Payment. The Bid unit price for the "Sewer Lateral with Private Replumbing" shall include installation of new pipe connecting each existing property plumbing to the new sewer main, trenchless construction (if required), installation of clean outs, and locating and capping or plugging the existing sewer piping. It shall include removal and reinstallation of fences, irrigation, landscaping, ground cover, excavation, backfill and compaction, fittings, and permits necessary to install the new sewer lateral system, in place, and to restore private improvements to pre-bid condition.

Potholing performed for the replumbs shall be included in the unit Bid price for the replumbing work.

306-1.7.3.6 Private Pump Installation. Private Pumps shall be installed when:

- a) Connection points for replumbs have been verified as stated on the Plans,

- b) Engineer has determined the elevation of the main in the street cannot be lowered and sufficient slope is unavailable to replumb a house by gravity means, or
- c) when noted on the Plans.

The Contractor shall notify the Engineer a minimum of 10 Working Days before beginning work on private pump.

The electrical wiring from the private pump shall be connected to the property's electrical panel, in accordance with all applicable governing codes, and the City electrical standards.

Prior to any private sewer pump system construction, the Contractor shall submit Working Drawings, and detailed installation instructions for equipment to be furnished including dimensional data and materials of construction in accordance with 2-5.3, "Submittals." The Working Drawings shall include a plan and profile showing location of the private pump, alarm panel, private force main, and point of connection to the existing building plumbing. Each Working Drawing shall include written approval by the property owner.

306-1.7.3.7 Payment. Payment for private pump system will be as follows:

- a) Pump System. The payment shall be included in the Bid item for Private Pump System. The payment for the private pump system shall include: the pumps and appurtenances, electrical hook ups, pump well, discharge line to the main, installation of clean outs, locating and capping or plugging the existing sewer piping, excavation, backfill and compaction, fittings, and permits necessary to install the new sewer lateral system, in place, and to restore private and public improvements e.g., removal and reinstallation of fences, irrigation, landscaping, and ground cover to pre-bid condition.
- b) Private Pump Compensation - Within 10 Working Days after the activation of a pump system, the Contractor shall make a payment of \$6,080 to the property owner. The Contractor shall provide to the City proof of payment by submitting a copy of the canceled check and a receipt with the property owners signature. The Contractor shall not be entitled to compensation unless this proof is provided. The pump payment and all related costs shall be included in the Bid item for "Pump Compensation."
- c) Extended Warranty. The payment for the extended warranty and the manufacturer's inspections shall be included in the payment for the private pump system unless a Bid item has been provided for the Private Pump Extended Warranty.

ADD: 306-1.8 Manholes. Manholes located outside of public right-of-way or in an unpaved area shall have covers locked to the frame as shown on the Standard Drawings.

Where a manhole is to be constructed on unstable native material, a stable base shall first be constructed with additional bedding material, in accordance with 306-1.2.1, "Bedding" to the dimensions specified in writing by the Engineer.

The abandonment of manholes outside the new trench area is a separate bid item and shall include all labor and materials necessary to abandon the manholes in accordance with 306-5, "ABANDONMENT OF CONDUITS AND STRUCTURES."

The cost of the locking device when required shall be included in the Contract bid item for sewer manholes.

Payment for water proofing and lining of manholes shall be included in the Bid item for Manholes unless a separate Bid item has been provided.

306-1.8.1 Polymer Mortar. Polymer mortar shall be used at the riser joints on all manholes to create water-tight joints to resist infiltration.

The mortar shall be mixed in accordance with manufacturers specifications, but shall not exceed 5 parts sand to 1 part polymer.

Materials shall be in accordance with 201-8.4, "Polymer Mortar."

The concrete or other surfaces that are to adhere to the polymer mortar shall be free from dust, loose aggregates, oil, grease, or other contaminants.

306-1.8.2 Plastic Liner. When noted on the Plans, in the Bid Proposal, or both pre-cast manhole risers, including cone, shall be lined with white polyvinyl chloride sheets. Material shall be in accordance with 210-2, "PLASTIC LINER." Manholes connecting to mains 18" or larger in diameter shall be PVC lined.

306-1.8.3 Polyurethane Lining. When PVC lined manholes and existing manhole reconstruction are noted on the Plans, in the Bid Proposal, or both bases and exposed concrete mortar surfaces, including any remaining risers, shall be protected with a polyurethane coating.

Except as otherwise indicated in this subsection, manhole reconstruction shall conform to 500-2.4, "Inspection, Testing and Repair of Installed Liner System."

The lining application shall be performed only by workers certified by the manufacturers as trained and experienced with the specified material in accordance with 201-8.5, "Polyurethane Coating" method and equipment of application.

The Contractor shall demonstrate the material on a sample area, which is representative of a Site application. When approved, the sample area shall serve as a standard for further work.

The installed protective coating shall be warranted by the Contractor and Applicator to be free of defects in materials or workmanship for a period of 10 years after acceptance. Should coating show defects during this period, including but not limited to, blistering, peeling, corrosion, or erosion, the City will immediately notify the Contractor. The Contractor/Applicator shall make repairs, at no additional expense to the City, on a schedule agreed to with the City.

306-1.8.4 Exterior Waterproofing. The exterior surface of all manholes located below plus seven 7' M.S.L or below ground water level shall be coated with a waterproofing agent consisting of a coal tar emulsion. The coal tar emulsion shall be applied in no less than 2 coats to achieve a total dry thickness of 25 to 35 mils.

306-1.8.5 Connection to Existing Manholes. Where connections to existing sewer manholes are required, the manholes shall be broken out as necessary to accommodate the new sewer pipe and the base shall be rechanneled, as required, to allow a smooth transition between the inlet and outlet pipe. The manhole reinforcing steel shall be cut only as required to allow the connection of the new pipe.

The existing concrete surface shall be cleaned and prepared with an approved concrete epoxy adhesive prior to the connection of the new pipe and placement of concrete dry pack.

306-1.8.6 Payment. The payment for connection to and rechanneling existing manholes shall be included in the Bid item for Connection to Existing Manhole and Rechanneling.

Where sewer drop manhole assembly is shown on the Plans the payment shall be included in the various Bid items unless a Bid item is provided.

Payment for a manhole shall be full compensation for labor and materials to construct complete in place, including, but not limited to, polymer mortar, and liner or coatings as specified. The cost of the locking device when required shall be included in the Contract bid item for sewer manholes.

306-5 ABANDONMENT OF CONDUITS AND STRUCTURES. ADD the following:

The Contractor shall plug existing sewer mains identified on the Plans to be abandoned at downstream locations approved by the Engineer. The Contractor shall monitor the abandonment for a 48 hour period to ensure that there is no flow in the existing main or laterals. If there is flow in the existing main, the Contractor shall perform a dye pack test to confirm the abandonment has been successfully completed.

Sewer pipelines to be abandoned in place shall be completely filled with CLSM in accordance with 201-6, "CONTROLLED LOW STRENGTH MATERIAL (CLSM)" or a combination of sand and concrete plug at both ends of each pipe segment. The Contractor shall demonstrate to the Engineer that conduits being abandoned are completely filled as evidenced by the filler material flowing through ventilation holes and the ends of pipe segments. The Contractor shall submit the method of abandonment, materials to be used, and locations and size of the ventilation holes in accordance with 2-5.3, "Submittals."

The Contractor shall notify the Public Utilities Department 48 hours in advance of abandonment to obtain the delivery location for salvaged manhole lids and frames.

ADD: 306-5.1 Removal and Abandonment of Existing Water Facilities. Existing facilities shall be abandoned unless indicated otherwise on the Plans or in the Specifications for removal. Any gate valve to be removed shall be removed entirely, together with the valve casing and cover. Any gate valve to be abandoned shall be abandoned in place by removing the cover and casing to subgrade, filling the remaining valve casing with sand, and restoring the pavement. Gate valves abandoned prior to construction, with a lid and casing found within the Project limits, shall be properly abandoned as stated above and paid for as Extra Work, as approved by the Engineer.

Any existing fire hydrant which is served by a main to be abandoned shall be abandoned, together with its services, unless otherwise shown on the detail plans. Fire hydrant services to be abandoned shall be blind flange or cut and plugged at least 12" below finished grade or below the top of curb, whichever is lower.

Where portions of the old main, services, or both are abandoned and left in place, the exposed ends of the abandoned main shall be tightly plugged with concrete and service ends shall be crimped, unless otherwise shown on the plans. Abandoned water services shall be located and shut off at the main.

Existing meter boxes previously abandoned within the Project limits shall be removed as specified here and paid for as Extra Work.

Voids resulting from abandoned or removed water services and meter boxes shall be filled with suitable material compacted to a relative compaction of 90% and concrete capped. For 16" and larger water main, the abandoned pipe shall be filled with sand or CLSM.

Salvaged material from the abandoned water mains and its appurtenances, except fire hydrant bodies, shall become the property of the Contractor at the time of its removal from the trench, unless otherwise specified or shown on the drawings. Such material shall not be allowed to accumulate along the line of work, but shall be removed from the area at the earliest practical time. Fire hydrant bodies shall be left at the Site and will be picked up by City Forces.

ADD: 306-5.2 Abandonment of Sewer Laterals. Sewer laterals to be abandoned shall be plugged with concrete at the property line or as located in the Site by the Engineer in the vicinity of the property unless otherwise shown on the Plans.

The Contractor shall ensure that the proposed sewer laterals have been successfully connected to the proposed sewer mains and that water tight capping or plugging has been completed before abandoning any existing sewer main and laterals.

ADD: 306-5.3 Payment. Payment for removing, plugging, and abandoning of existing water pipes and appurtenances within the proposed trench zone shall be included in the Bid item for new water pipes.

Payment for removing, plugging, and abandoning of existing water pipes and appurtenances outside the proposed trench zone shall be included in the Bid item for removal or abandonment of the existing water facilities.

For 16" and larger water mains and appurtenances to be abandoned outside of the trench limits, payment shall be included in the unit price Bid item for Large Water Main Abandonment.

Payment for service laterals to be plugged and abandoned in place shall be included in the Bid item for sewer mains.

Payment for sewer pipelines filled and abandoned in place shall be included in the unit price Bid item for abandon and fill existing sewer main outside trench limit.

Payment for the abandonment of existing manholes outside the trench area including concrete plugs shall be included in the Bid item for Manhole Abandonment.

ADD: 306-13 EXISTING UTILITIES. Where existing underground utilities are undercut, particular care shall be exercised in selecting, placing, and compacting backfill material under and around such utility to assure firm support. For at least 12" all around the undercut utility, the backfill material shall conform to 306-1.2.1, "Bedding."

The Contractor shall be responsible for the altering, relocating, or reconstructing of portions of existing water or sewer connections which may or may not have been shown on the Plans, or not accurately shown on the Plans, but which are found to interfere with the Work. The Contractor shall contact and coordinate alteration, relocation, or reconstruction of gas, electric, cable or telephone service connections with the owner of such utilities.

Abandoned water services (stiff) not shown on the Plans, but found to interfere with the progress of work shall be shut off and cut 6" from the main. The payment shall be included in the Bid item for Abandon Water Services (Stiffs).

306-13.1 Support for Existing Water Mains. Existing water mains, which are not high-lined, shall remain in service during construction. Water mains shall require vertical and horizontal support at tees, crosses, bends, etc.

Payment shall be included in the Bid item for the item of Work necessitating the utility work.

ADD: 306-13.3 Utility Crossings. If 1' vertical separation cannot be maintained between proposed and existing utilities, 6" – 11" sand cushion per 200-1.5, "Sand" and 1" neoprene pad shall be installed as shown on Plans. The neoprene pad shall be 1" thick and wide enough to extend a minimum of 6" horizontally beyond the outside pipe wall. Neoprene pads shall have hardness

between 50-70 durometers, as manufactured by Hoffmeyer Company, Industrial Rubber Supply, or approved equal. The neoprene pad shall be installed right below or on top of the existing utility. The sand cushion shall be placed between the neoprene pad and the proposed pipe.

Payment for installation of sand cushion and neoprene pad shall be included in the unit price Bid item for new pipe installation.

ADD: 306-14 WATER SERVICES. Each service shall have its own meter (unless specified otherwise on the Plans).

New water services shall be:

- a) 1" copper
- b) 2" copper or PVC
- c) 4" or 6" PVC.

Services, including transfers and extensions, shall be tested and disinfected in the same manner as water mains. These operations shall be performed concurrently with the testing and disinfecting of the water main, where practicable.

Water services shall not be connected to thin walled pipe such as milled over all pipe, Polyvinyl Chloride (PVC) pressure pipe, or to 4" pipe unless bronze pipe saddle is used. See approved Materials List for acceptable tapping saddles.

Corporation stops for service connections to water mains shall be placed not less than 30" on centers along which the connections are to be made. Corporation stops at the end of a capped pipe shall be a minimum of 15" away from the cap.

Water services shall be connected to water mains at the sides. Water service connections at the top of water mains are not allowed.

306-14.1 Payment. The Contractor shall be paid for the actual number of transfers, extensions or complete services installed at the unit price bid in the Proposal.

New water meter boxes shall be included in the bid price for water services.

ADD: 306-14.2 TRENCHLESS METHOD FOR WATER SERVICES.

306-14.2.1 General. The trenchless methods for the installation of water services shall be used at the Contractor's option or when noted on the Plans.

306-14.2.2 Submittals. The Contractor shall submit the following information in accordance with 2-5.3, "Submittals:"

- a) Address and schedule of water services.
- b) Method for trenchless construction.
- c) Launch and receiving pit and shaft dimensions.
- d) Proposed drill path alignment (both horizontal and vertical).
- e) Tunnel diameter.
- f) Minimum depth of cover.
- g) Construction procedure and operation sequence.
- h) Tunneling equipment.

The Contractor shall obtain the Engineer's approval prior to the start of any boring operations.

306-14.2.3 Water Service Construction. Copper pipe shall be placed in a perforated sleeve and shall not be pushed or pulled against soil during the installation of water services. The sleeve shall be installed between meter and main launching pits. The sleeve shall be cut flush with walls of meter and main launching pits.

The inside diameter of sleeve shall be at least 1" greater than outside diameter of water service. The sleeve tunnel diameter shall not exceed the sleeve diameter by more than 2" and shall align horizontally within 3" of meter inlet location. The sleeve material shall be PVC SDR 35 (or higher class). HDPE SDR 21 (or higher class) may be used in lieu of PVC.

The construction for each service shall be scheduled to minimize water disruption to the property being served.

306-14.2.4 Payment. Payment for trenchless construction of water services shall be included in the Bid item for "Water Services." If the trenchless installation as proposed by the Contractor becomes infeasible or does not comply with these specifications, the water services shall be installed by open trench methods and paid for per Bid item for "Water Services".

ADD: 306-15 WATER METER BOXES. Water meter boxes that are called out as a Bid item only shall be installed at locations determined by the Engineer.

ADD: 306-16 TEMPORARY BLOWOFFS. Caps and plugs installed by the Contractor to temporarily close the ends of new mains adjacent to points of connection shall contain 2" outlets with corporation stops. Corporation stops shall protrude free from thrust blocks and be available for use in relieving pressure in the mains prior to connecting. Caps and outlets are the property of the Contractor and shall be removed from the Site after main connections are made.

The payment for temporary blowoffs shall be included in the Bid item for water mains.

ADD: 306-17 OUT-OF-SERVICE FIRE HYDRANT DISCS. The out-of-service hydrant discs shall be:

- a) constructed of heavy-duty plastic and shall have an inside diameter large enough to easily slide over the large port of a fire hydrant (refer to the Standard Drawings for fire hydrant installation) and a minimum outside diameter of 11 ¼",
- b) a minimum of 1/16" thick,
- c) resistant to tearing, ripping, extreme changes in temperature and vandalism, and
- d) of a highly visible color of red.

Unless specified otherwise in the Special Provisions, the Contractor maintain City provided out-of-service hydrant discs on the large port of every newly installed fire hydrant immediately after it has been bolted in place and existing assemblies that have been taken out of service. The Contractor shall unscrew the cap on the large port, place the disc on the port, and securely replace the cap.

The Contractor shall ensure that the out-of-service hydrant discs remain on the fire hydrants until the new main has been connected to the existing main and accepted.

Once in service, City Forces will remove and retain the out-of-service hydrant discs.

Payment for fire hydrants discs shall be included in the Bid item for the proposed fire hydrants.

ADD: 306-18 BLOWOFF VALVE ASSEMBLIES. The Contractor shall field verify, with the approval of the Engineer, the final location of each assembly.

Payment shall be included in the various Bid items unless a pay item has been provided for Blowoff Valve Assemblies.

ADD: 306-19 AIR AND VACUUM VALVE ASSEMBLIES. The Contractor shall field verify, with the approval of the Engineer, the final location of each enclosure.

Payment shall be included in the various Bid items unless a pay item has been provided for Air and Vacuum Valve Assemblies.

ADD: 306-20 HORIZONTAL DIRECTIONAL DRILLING.

306-20.1 General Horizontal Directional Drilling (HDD) is a multiple pass trenchless construction technique for installing underground conduits utilizing specialty equipment, driller's mud, and directional locating system(s) along a predetermined path. **When specified** or as approved by the Engineer, HDD shall be subject to the following specifications.

306-20.2 Contractor's Qualifications and Submittals. The Contractor shall be a certified installer trained and experienced in the use of the HDD method.

The Contractor shall submit the following items in accordance with 2-5.3, "Submittals" for the Engineer's approval prior to ordering pipe materials and the start of the Work.

- a) List of past HDD projects successfully completed by the personnel leading the work, including at least 5 miles in the last 5 years, and current reference for each project.
- b) Certification that the Contractor is currently licensed by the HDD system manufacturer as an installer of their system.
- c) Pipe fusion or welding operator current certification by the fusion or welding equipment manufacturers.
- d) Preprinted machine specifications or a letter from the HDD machine manufacturer demonstrating that the selected machine(s) is capable of progressing through the anticipated soil conditions suitable for the size and scope of the Project. Calculations showing drill rig shall exceed maximum anticipated pullback of pushing forces, as measured by the worst case, by at least 25%.
- e) Construction procedure for pipe installation including:
 - i. Insertion and receiving pits proposed dimensions, locations, method of excavation, shoring, bracing and ventilation. Pits shall be of the smallest size practical for construction and have a sump to remove incidental construction water.
 - ii. Equipment technical data and operating procedures.
 - iii. Method of construction, reconnection and restoration of existing sewer laterals, if applicable.
 - iv. Sewer bypass plans as required.
- f) Contingency plans for approval for the following potential conditions:
 - i. Monitoring for loss of ground or heaving.
 - ii. Encountering an unforeseen obstruction.
 - iii. Loss of, and return to, line and grade.

- g) Manufacturer recommendations for handling, storage, and repair of pipe and fittings. Pipe physical properties and specifications. Calculations indicating that the method or process used does not exceed the allowable tensile and compression limits of the pipe and the pipe can withstand the final in place loading.
- h) Proposed tracking method to be used during construction.
- i) Layout of HDD equipment and above ground equipment at each shaft location. For projects with limited work area, the HDD machine shall be a pit launched machine.
- j) Driller's mud mixing and recycling system details. Information about the drilling fluid to be used, including product information, material specifications, and handling procedures; material safety data sheet and special precautions required; methods of mixing and application; and disposal plan. Circulating pumping capacity as measured by volume, density, and psi shall exceed maximum anticipated requirements by 20%.
- k) Method of spoil removal, spoil disposal, disposal location.
- l) Electrical system, lighting system, and onsite power generation.
- m) Grade and alignment control system details including direction of drive.
- n) Compressed air plant details if a pneumatic hammer system is used. Air compressor capacity as measured by volume and psi shall exceed maximum anticipated requirements by approximately 20%.

306-20.3 Drilling System Equipment. The directional drilling equipment shall consist of a directional drilling rig of sufficient capacity to perform the bore(s) and pullback of the pipe(s), a drilling fluid mixing and delivery system of sufficient capacity to successfully complete the Work, and a guidance system to accurately guide boring operations.

306-20.3.1 Drilling Rig. The directional drilling machine shall consist of a hydraulically powered system to rotate, push and pull drill pipe while delivering a pressurized fluid mixture to a steer-able drill head. The drill rig may include drill steel handling equipment and grippers for the adding or removal of additional lengths of drill steel. The machine shall be anchored to withstand the pulling, pushing and rotating forces required to complete the project. The drilling rig hydraulic system shall be self-contained with sufficient pressure and volume to power drilling operations. Hydraulic system shall be free of leaks. The drilling rig shall have a system to monitor and record maximum pull-back hydraulic pressure during pull-back operations.

306-20.3.2 Drill Head. The horizontal directional drilling equipment shall produce a stable fluid lined tunnel with the use of a steer-able drill head. The system shall be able to control the depth and direction of the pipe. Drill head shall contain all necessary cutters and fluid jets for the operation, and shall be of the appropriate design for the medium being drilled.

306-20.3.3 Drilling Fluid System.

306-20.3.3.1 Drilling Fluid (MUD). Drilling fluid shall be composed of clean water and the appropriate additive(s) for the fluid to be used. Water shall be from a clean source and shall meet the mixing requirements of the manufacturer. The water and additives shall be mixed thoroughly to assure the absence of any clumps or clods. No hazardous additives may be used.

Drilling fluid shall be maintained at a viscosity sufficient to suspend cuttings and maintain the integrity of bore wall(s). Drilling fluid shall be disposed of off-site in accordance with local, state and federal requirements, and permit conditions. No additional chemicals or polymer surfactants shall be allowed to be added to the drilling fluid as submitted for this project without written consent of the Engineer.

306-20.3.3.2 Mixing System. A self-contained, closed, drilling fluid mixing system shall be of sufficient size to mix and deliver drilling fluid for the Project. The mixing system shall be able to ensure thorough mixing of the drilling fluid. The drilling fluid reservoir tank shall be sized for adequate storage of the fluid. The mixing system shall continually agitate the drilling fluid during drilling operations.

306-20.3.3.3 Drilling Fluid Delivery and Recovery System. The drilling fluid pumping system shall have a minimum capacity to supply drilling fluid in accordance with the drilling equipment pull-back rating at a constant required pressure. The delivery system shall have filters or other appropriate in-line equipment to prevent solids from being pumped into the drill pipe.

Used drilling fluid and drilling fluid spilled during drilling operations shall be contained and properly disposed of. The use of spill containment measures shall be maintained around drill rigs, drilling fluid mixing system, entry and exit pits and drilling fluid recycling system (if used) to prevent spills into the surrounding environment. Pumps, vacuum truck(s), and storage of sufficient size shall be in place to contain excess drilling fluid.

A closed-loop drilling fluid system and a drilling fluid cleaning system shall be used to whatever extent practical, depending upon project size and conditions. Under no circumstances shall drilling fluid that has escaped containment be reused in the drilling system.

In the event of a drilling fluid fracture, returns loss or other loss of drilling fluid, operations shall immediately cease and the Contractor shall be responsible for restoring any damaged property to original condition and cleaning up the area in the vicinity of the damage or loss. The Contractor shall immediately inform the Engineer.

306-20.3.4 Pipe Pull Heads. Pipe pulls heads shall be utilized that employ a positive through-bolt design assuring a smooth wall against the pipe cross-section at all times. Pipe pull heads shall be specifically designed for use with fusible pipe, and shall be as recommended by the pipe supplier.

306-20.4 Insertion or Access Pits (Shaft). The pits shall be located such that their total number shall be minimized and the length of replacement pipe installed in a single pull shall be maximized. Locations of manholes shall be used for insertion or access pits when feasible.

Excavation shall be between the easements or right-of-way lines to the lines and grades designated on the drawings. The Contractor shall size and locate pits so they minimize interferences with vehicular and pedestrian traffic. If the traffic plans cannot accommodate the location or size of the proposed access pits, the Contractor shall be responsible for the changes, or new plans required in accordance with 7-10, "PUBLIC CONVENIENCE AND SAFETY."

Entry and exit areas shall be excavated so as not to exceed the bending limitations of the pipe as recommended by the manufacturer. The pit(s) and related excavations shall be shored to prevent any movement or slippage of earth. The Contractor shall take the necessary precautions (e.g., chain link fencing or plating) to prevent unauthorized persons from accidentally entering the pits.

306-20.5 Drilling Layout. The drill path shall be accurately surveyed with entry and exit areas placed in the appropriate locations within the areas indicated on Plans. If using a magnetic guidance system, drill path will be surveyed for any surface geomagnetic variations or anomalies. Instrumentation shall be provided and maintained at all times that accurately locates the pilot hole, measures drill-string axial and torsional loads and measures drilling fluid discharge rate and pressure. Entry and exit areas shall be drilled without exceeding the bending limitations of the pipe as recommended by the manufacturer.

306-20.6 Site Location Preparation. The Site as indicated on Plans shall be graded or filled to provide a level working area. No alterations beyond what is required for operations shall be made. The Contractor shall confine all activities to designated Work areas.

306-20.7 Drilling Control System. The system shall be able to control the depth and direction of the pipe. Calibration of the electronic detection and control system shall be verified prior to the start of the bore. The drilling head shall be remotely steer-able by means of an electronic or magnetic detection system.

The drilling head location shall be monitored in three dimensions:

- a) Offset from the baseline,
- b) Distance along the baseline, and
- c) Depth of cover.

306-20.7 Hole Boring.

306-20.7.1 Pilot Hole Bore. Pilot hole shall be drilled along bore path. In the event that the pilot bore does deviate from the bore path, the Contractor shall notify the Engineer and the Engineer may require contractor to pull-back and re-drill from the location along bore path before the deviation.

The Contractor shall limit curvature in any direction to reduce force on the pipe during pullback. The minimum radius of curvature shall be no less than that specified by the pipe manufacturer and as indicated on the Plans. In the event that a drilling fluid fracture, inadvertent returns or returns loss occurs during pilot hole drilling operations, Contractor shall cease drilling and contact the Engineer.

The pilot hole bore alignment shall be approved by the Engineer prior to back reaming phase and pipe installation.

306-20.7.2 Reaming. After successfully completing the pilot hole, the bore hole shall be reamed to a diameter which meets the following minimum values:

Nominal Pipe Diameter	Bore Hole Diameter
< 8 inches	Pipe Dia. + 4 inches
8 inches to 24 inches	Pipe Dia. X 1.5
> 24 inches	Pipe Dia. + 12 inches

A swivel shall be used between the reaming head and the fusible pipe to minimize torsion stress on the assembly.

306-20.8 Carrier Pipe. Carrier pipe materials shall be approved by the Engineer. The Contractor shall use only PVC or HDPE. The Contractor shall furnish and install a structurally sound, leak-proof, fusible polyvinylchloride pipe or fusible high density polyethelene pipe, for all piping identified for installation by horizontal directional drilling. The Contractor shall be responsible for the sizing of the carrier pipe to withstand all installation forces, curvature, and residual forces and final in place

loading. The selected material shall have an inside diameter no less than stated on the drawings. Individual pipe lengths shall be assembled by butt-fusion unless otherwise specified.

306-20.9 Ground Monitoring. The Contractor shall monitor for ground movement associated with the Work and shall maintain no ground settlement or heave. The pipe shall be installed in a manner that does not cause upheaval, settlement, cracking, or movement and distortion of surface features. The Contractor shall monitor for ground movement associated with the Work and make all efforts to maintain no settlement or heave. Monitoring points shall include the centerline of the designed installation with points on the adjacent foundations, unless otherwise approved by the Engineer. The Contractor shall be responsible for any damage to existing utilities, structures, and adjacent properties due to settlement or heave and shall repair or replace them in kind at no cost to the City.

306-20.10 Television Inspection and Cleaning. The Contractor shall inspect the sewer pipe immediately after the pipe installation in accordance with 500-1.1.5, "Television Inspection". Prior to pipeline CCTV inspection, the Contractor shall perform sewer cleaning in accordance with 500-1.1.4, "Cleaning and Preliminary Inspection".

306-20.11 Quality Control. Pipe not meeting the requirements of the Contract Documents shall be abandoned, full pressure grouted in place in accordance with section 306-5, "ABANDONMENT OF CONDUITS AND STRUCTURES" and an alternate installation shall be done at no cost to the City. The abandoned pipe shall be properly shown on the Red-lines.

- a) Line shall not vary from designed centerline by more than 1.0 inch horizontally and shall always be within the confined right of way. Grade shall always intersect the tie-in, provide a properly functioning gravity sewer, shall be $\pm 1.0\%$ of design grade at all times and never less than 1% for sewer mains and 2% for sewer laterals, unless otherwise shown on the plans.
- b) If misalignment is encountered during installation due to voids surrounding the existing pipe, the Contractor shall replace the defective section by making point repair acceptable to the Engineer. The Contractor will be compensated for such corrective measures if the Engineer determines that such difficulties are due to existing voids. The Contractor shall inform and demonstrate to the Engineer, or the misalignment will be considered to be caused by the Contractor's failure to follow correct installation procedures, and corrective measures shall be done at no cost to the City.
- c) If pre-installation CCTV inspection reveals sag, offset joint, or obstruction in the existing sewer it shall be the Contractor shall install the replacement pipe for an acceptable finished product. The Contractor shall take the necessary measures to eliminate the unacceptable conditions described in these specifications by making point repairs in accordance with 500-1.2, "Pipeline Point Repair/Replacement", or by other measures acceptable to the Engineer.
- d) The Contractor shall re-drill another line at no additional cost to the City if gouges or excessive surface damage of more than 10% of the wall thickness.
- e) The tolerance for the annular space shall be 1" unless the Contractor demonstrates that a proposed higher tolerance is the minimum possible without affecting the main pipeline.
- f) Testing of materials shall be in accordance with 500-1.1.6, "Sampling, Testing, and Installation." Testing of the finished pipe shall be performed in accordance with 306-1.4, "Testing Pipelines". Refer to 500-1.1.8, "Rejection" for rejection criteria.
- g) During installation the Contractor shall install a rock trap in the downstream manhole. The Contractor shall install the trap daily prior to commencement of work and shall monitor during the working hours. The trap shall be removed at the end of each Working Day.

306-20.12 Measurement and Payment. The payment shall be included in the unit price Bid item for the proposed pipe unless separate Bid item has been provided for HDD pipe.

ADD: 306-21 PIPE BURSTING.

306-21.1 General. Pipe bursting is the process of bursting the existing pipe, compressing the old pipe sections into the surrounding soil, while simultaneously installing a new pipe of the same or larger size inside the annulus created, followed by sewer lateral reconnections.

When specified or as approved by the Engineer, pipe bursting shall be subject to the following specifications.

306-21.2 Contractor's Qualifications and Submittals. The Contractor shall be a certified installer trained and experienced in the use of the pipe bursting method. The pipe welding shall be performed by personnel trained, experienced, and certified in the use of the welding equipment.

The Contractor shall submit the following items in accordance with 2-5.3, "Submittals" for the Engineer's approval prior to ordering pipe materials and the start of the Work.

- a) List of past projects successfully completed by the personnel leading the Work, including at least 5 miles in the last 5 years, and current reference for each project.
- b) Certification that the Contractor is licensed by the trenchless pipe replacement system manufacturer as an installer of their system.
- c) Pipe fusion or welding operator certification by the fusion or welding equipment manufacturers.
- d) Construction procedure for pipe installation:
 - i. Insertion and receiving pits proposed dimensions, locations, method of excavation, shoring, and bracing.
 - ii. Equipment technical data and operating procedures.
 - iii. Manufacturer recommendations for handling, storage, and repair of pipe and fittings.
 - iv. CCTV inspection performed to locate live services, sags, offset joints, obstructions, and all other necessary information per 500-1.1.5, "Television Inspection"
 - v. Proposed point repair locations and methods.
 - vi. Method of construction, reconnection and restoration of existing sewer laterals.
 - vii. Sewer bypass plans as required. Contingency plans for approval for the following potential conditions:
 - Monitoring for loss of ground or heaving.
 - Encountering an unforeseen obstruction.
 - Loss of, and return to, line and grade.

- e) Pipe physical properties and specifications. Calculations indicating that the method or process used does not exceed the allowable tensile and compression limits of the pipe. Proposed tracking method to be used during construction (e.g., pulling logs).

306-21.3 High Density Polyethylene (HDPE) Pipe Installation.

Sections of polyethylene replacement pipe shall be assembled and joined on the job site above the ground. The replacement pipe shall be joined in appropriate working lengths near the insertion pit. Jointing shall be accomplished by the heating and butt-fusion system in strict conformance with the manufacturer's printed instructions. The joints shall have a smooth, uniform, double rolled back bead between 1/8" and 3/16", made while applying the proper melt, pressure, and alignment. The beads shall be removed prior to pipe installation. The final pipe surfaces shall be smooth after bead removal. Joints shall be made available for inspection by the Engineer before insertion.

Pipes shall be capable of withstanding all forces imposed in the process of installation and the final in-place loading conditions. The pipe, including the ends and joints, shall be protected against damage. Any pipe damaged during installation shall be replaced by the Contractor. The replacement of damaged pipe or installation of a new pipe shall be at no additional cost to the City.

The installed replacement pipe shall be continuous over the entire length of each pipe segment from manhole to manhole. Replacement pipe with gashes, nicks, abrasions, or any such physical damage which may have occurred during storage or handling shall not be used and shall be removed from the Site. The Contractor shall exercise care in handling the pipe and shall not drag the pipe on pavement.

306-21.4 Insertion or Access Pits (Shaft). See 306-20.4, "Insertion or Access Pits (Shaft)."

306-21.5 Sewer Lateral Connections. The Contractor shall locate and expose sewer lateral connections prior to pipe installation. Reconnections shall be performed immediately after mainline pipe bursting.

Sewer laterals shall be reconnected to the pipe by using heat or electro-fusion tee or wye (Y) or strap saddles. Heat or electro-fusion tees and wye saddles shall be made of a polyethylene pipe compound that meets the requirements of ASTM D1248, Class C, suitable for fusion welding to polyethylene pipe. Once saddles are secured in place, a hole shall be drilled to the size of the full inside diameter of the saddle outlet. Edges shall be smooth and free of abraded and loose material.

306-21.6 Ground Movement. See 306-20.9, "Ground Monitoring."

306-21.7 Television Inspection and Cleaning. See 306-20.10, "Television Inspection and Cleaning."

306-21.8 Quality Control. See 306-20.11, "Quality Control."

306-21.9 Payment. The payment for pipe bursting installations and service connections shall be included in the unit price Bid item for the proposed pipe service connections unless separate Bid items have been provided.

306-22 Pipe Fusion.

306-22.1 Fusion Technician Requirements. Fusible polyvinylchloride pipe shall be fused by qualified fusion technicians, as documented by the pipe supplier. Training records for qualified fusion technicians shall be available to the Engineer upon request.

Fusion Technician shall be fully qualified by the pipe supplier to install fusible polyvinylchloride pipe of the type(s) and size(s) being used.

306-22.2 Fusion Process. Fusible pipe shall be handled in a safe and non-destructive manner before, during, and after the fusion process and in accordance with these specifications and pipe supplier's recommendations.

- a) The fusible pipe shall be installed without exceeding the recommended bending radius.
- b) Where fusible pipe is installed by pulling in tension, the recommended safe pulling force, according to the pipe supplier, shall not be exceeded.
- c) Only appropriately sized, and outfitted fusion machines that have been approved by the pipe supplier shall be used for the fusion process.
- a) Only appropriately sized, and outfitted fusion machines that have been approved by the pipe supplier shall be used for the fusion process. Fusion machines shall incorporate the following properties, including the following elements:
 - i. HEAT PLATE - Heat plates shall be in good condition with no deep gouges or scratches within the pipe circle being fused. Plates shall be clean and free of any contamination. Heater controls shall properly function, and cord and plug shall be in good condition. The appropriately sized heat plate shall be capable of maintaining a uniform and consistent heat profile and temperature for the size of pipe being fused, per the pipe supplier's recommendations.
 - ii. CARRIAGE – Carriage shall travel smoothly with no binding at less than 50 psi. Jaws shall be in good condition with proper inserts for the pipe size being fused. Insert pins shall be installed with no interference to carriage travel.
 - iii. GENERAL MACHINE - Overview of machine body shall yield no obvious defects, missing parts, or potential safety issues during fusion.
 - iv. DATALOGGER - The current version of the pipe supplier's recommended and compatible software shall be used. Protective case shall be utilized for the hand held wireless portion of the unit. Datalogger operations and maintenance manual shall be with the unit at all times. If fusing for extended periods of time, an independent 110V power source shall be available to extend battery life.
- b) Other equipment specifically required for the fusion process shall include the following:
 - i. Pipe rollers shall be used for support of pipe to either side of the machine.
 - ii. A weather protection canopy that allows full machine motion of the heat plate, fusion assembly and carriage shall be provided for fusion in inclement and /or windy weather.
 - iii. Fusion machine operations and maintenance manual shall be kept with the fusion machine at all times.
 - iv. Facing blades specifically designed for cutting fusible polyvinylchloride pipe.
- c) Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine. The fusion data logging and joint report shall be generated by software developed specifically for the fusion of fusible polyvinylchloride pipe. The software shall include fusible polyvinylchloride pipe based dimensional data and fusible

polyvinylchloride pipe based interfacial pressure relationships. Data not logged by the data logger shall be logged manually and be included in the Fusion Technician's joint report.

306-22.3 Fusion Joints. Unless otherwise specified, fusible polyvinylchloride pipe lengths shall be assembled in the field with butt-fused joints. The Contractor shall follow the pipe supplier's written instructions for this procedure. Joint strength shall be equal to the pipe as demonstrated by testing requirements fusion joints shall be completed as described in these specifications.

All internal and external beads shall be removed prior to installation in accordance with the manufacturer's recommendation. The final pipe surfaces shall be smooth after bead removal. Joints shall be made available for inspection by the Engineer before insertion.

PVC gasketed, push-on fittings and retainer glands shall be installed per the manufacturer's recommendations.

306-22.4 Pipe Installation. The pipe, including the ends and joints, shall be protected against damage. Any pipe damaged during installation shall be replaced by the Contractor. Pipe shall be fused prior to insertion. The installed replacement pipe shall be continuous over the entire length from manhole to manhole. Replacement pipe with gashes, nicks, abrasions, or any such physical damage which may have occurred during storage or handling shall not be used and shall be removed from the Site. The Contractor shall exercise care in handling the pipe and shall not drag the pipe on pavement.

306-22.5 Pipe Pull-Back and Insertion. The Contractor shall handle the pipe in a manner that will not over-stress the pipe prior to insertion. Vertical and horizontal curves shall be limited so that the pipe does not over-deflect, buckle, or otherwise become damaged. Damaged portions of the pipe shall be removed and replaced.

The pipe entry area shall be graded if needed to provide support for the pipe and to allow free movement into the bore hole. The pipe shall be guided into the bore hole without deformation.

Once pullback operations have commenced, the operation shall continue without interruption until the pipe is completely pulled through the bore hole. Except for drill rod removal, pull-back operation shall not cease until the pipe has been completely installed to final position. During the pull-back operations, excessive pullback force shall be reported to and the Engineer.

306-22.6 Connection to Sanitary Sewer Manholes and Structures. Fusible polyvinylchloride pipe shall be connected to manholes and other structures to provide a leak-free, properly graded flow into or out of the manhole or structure.

- a) For a cored or drilled opening, provide a flexible, watertight connection that meets or exceeds ASTM C923.
- b) For a knock out opening, provide a watertight connection meeting the material requirements of ASTM C923 that is securely attached to the pipe with stainless steel bands or other means.
- c) Grout opening in manhole wall with non-shrink grout. Pour concrete collar around pipe and outside manhole opening. Provide flexible pipe joint or flexible connector within 2' of collar.
- d) A flexible, watertight gasket per ASTM C923 shall be cast integrally with riser section(s) for all precast manhole and structures.
- e) Grout internal joint space with non-shrink grout.

306-22.7 Ground Monitoring. See 306-20.9, "Ground Monitoring."

306-22.8 Television Inspection and Cleaning. See 306-20.10, "Television Inspection and Cleaning."

306-22.9 Quality Control. See 306-20.11, "Quality Control."

306-22.10 Payment. The payment for pipe installations and service connections shall be included in the unit price Bid item for the proposed pipe service connections unless separate Bid items have been provided.

SECTION 307 – STREET LIGHTING AND TRAFFIC SIGNAL SYSTEMS

DELETE GREENBOOK, Section 307 in its entirety and SUBSTITUTE with the following:

Section 307, "STREET LIGHTING AND TRAFFIC SIGNAL SYSTEMS" shall be used in conjunction with Section 86 of the Standard Specifications of the Caltrans, May, 2006 edition and Section 209 of these specifications.

307-1 INSTALLATION.

307-1.1 GENERAL. The Contractor shall determine the quantities required to complete the Work. The quantities and values shall be included in the Schedule of Values in accordance with 9-2.2.1, "Schedule of Values (SOV)" submitted to the Engineer for approval per 2-5.3, "Submittals" within 10 Working Days after Award of the Contract.

No adjustment in compensation will be made in the Contract lump sum prices paid for the various electrical Work items due to differences between the quantities shown in the SOV and the quantities required to complete the Work.

The SOV shall include the following items:

- a) Foundations - Each Type
- b) Standards And Poles - List By Each Type
- c) Conduit - List By Each Size And Installation Method
- d) Pull Boxes - Each Type
- e) Conductors - Each Size And Type
- f) Service Equipment Enclosures
- g) Signal Heads And Hardware - Each Type
- h) Pedestrian Signal Heads And Hardware - Each Type
- i) Pedestrian Push Buttons
- j) Loop Detectors - Each Type
- k) Luminaires - Each Type

307-1.2 Maintaining Existing and Temporary Electrical Systems. Traffic signal system shutdowns shall be limited to periods allowed for lane closures listed or described under "Maintaining Traffic," in the **Special Provisions**.

307-1.23 Scheduling of Work. No material or equipment shall be stored at the Site until receipt of notification by the Engineer. No poles shall be erected more than 3 weeks prior to the scheduled traffic signal turn-on date.

307-2 Payment. Payment for warning tape, trace wire, and the cement pigment to achieve the color required shall be included in the unit price paid for the conduit involved and no separate payment will be made therefore.

If a separate Bid item has not been provided for an item of the Work related to STREET LIGHTING AND TRAFFIC SIGNAL SYSTEMS as described or shown in the Contract Documents, the payment shall be included in the various Bid items.

SECTION 308 – LANDSCAPE AND IRRIGATION INSTALLATION

308-1 GENERAL. Last paragraph, DELETE in its entirety and SUBSTITUTE with the following:

Work on the irrigation system including hydrostatic tests, backfill and densification of trenches, and other excavations shall be performed before topsoil placement. Preliminary operational tests of the automatic control system and coverage tests shall be performed after top soil placement.

Trees or shrubs which have been identified to remain as shown on the Plans shall be protected. Construction fencing minimum 5' high shall be placed around the drip line of the tree or cluster of trees to protect the entire area. No material shall be stored nor shall equipment be permitted within the fenced area. No pruning of the tree canopy shall be permitted without written recommendation of a certified arborist submitted and approved by the Engineer. No digging or excavation shall occur under the drip line of the tree unless authorized by the Engineer. Failure to properly protect the identified trees may result in charges against the Contractor's account based on the assessed value of the tree and other damages once valued by a certified arborist.

308-2.2 Trench Excavation and Backfill. Second paragraph, REVISE to read as follows:

Unless otherwise specified, the minimum depth of cover over pipelines, sleeves, and conduits shall be as follows:

- a) Electrical conduit – 18" (450 mm)
- b) Water lines continuously pressurized – 21" (530 mm) and 36" (1 meter) when under paved areas accessible by vehicles.
- c) Lateral sprinkler lines – 15" (375 mm)

308-2.3.1 General. First sentence, DELETE in its entirety and SUBSTITUTE with the following:

The type and thickness of topsoil shall be shown on the Plans, or if not shown, shall be Class A, 10" (250 mm) thick.

Third paragraph, DELETE in its entirety and SUBSTITUTE with the following:

The subgrade soil below the proposed top soil shall be scarified in a cross pattern to a depth of 3" (75 mm) for subgrade for Class A or B topsoil. Stones over 1" (25 mm) in greatest dimension shall be removed from the scarified area.

308-2.3.2 Fertilizing and Conditioning Procedures. Third Paragraph, first sentence, REVISE to read as follows:

After spreading, the soil amendments shall be cultivated into the upper 10" (250 mm) of soil by suitable equipment operated in at least 2 directions at right angles.

308-2.3.3 Topsoil in Turf Areas. In areas to be planted in turf, the existing site soil shall be excavated to a depth of 15" below finish grade. The subgrade soil shall be scarified in a cross pattern to a depth of 3" (75 mm) and rocks over 1" (25 mm) in greatest dimension shall be removed from the scarified area. The excavated site soil shall be screened to remove all rocks and debris ½" and greater in size, and screened site soil shall be placed to a depth of not more than 5" (125 mm). Class A topsoil shall then be placed to a depth of not less than 10" (300 mm) to finish grade.

308-2.4 Finish Grading. Second paragraph: CHANGE the words "one inch (25 mm)" to "1/2" (12.5 mm)".

Last paragraph, second sentence, DELETE in its entirety and SUBSTITUTE with the following:

After the soil has dried out to a workable condition, the planting areas shall be regraded, raked, and smoothed to the required grades and contours. Topsoil shall be mechanically compacted to a minimum relative compaction of 85 percent.

ADD the following:

Application of the herbicides shall be **as specified in the Special Provisions.**

Except as noted for specimen planting, all planting installation shall take place after the completion of the finish grading and installation of the irrigation system.

308-4.2 Protection and Storage. ADD the following:

Sun sensitive plants, stolons, and stacked or pallet sod shall be stored in the shade or screened from the sun.

308-4.5 Tree and Shrub Planting. First sentence, DELETE in its entirety and SUBSTITUTE with the following:

Planting holes shall be the depth of and twice the width of the plant container or ball, and shall be larger if necessary to permit handling and planting without injury or breakage of the root ball or root system.

Third paragraph, DELETE in its entirety and SUBSTITUTE with the following:

The native soil at the bottom and sides of planting holes shall be scarified.

Fourth paragraph, DELETE in its entirety and SUBSTITUTE with the following:

Prepared backfill mix for shrub planting shall consist of 20% to 40% by volume of Type 1, 2, or 3 organic soil amendments mixed with native soil, depending on soil conditions at each site, as approved by the Engineer.

Fifth paragraph, DELETE parts (1) through (7) and SUBSTITUTE with the following:

- a) The plant shall be set at the center of the hole.
- b) Backfill shall be deposited in the hole to finish grade.
- c) The backfill shall be thoroughly water-settled and additional backfill added to fill any remaining void below finish grade.
- d) After the water has drained, the specified number of fertilizer tablets shall be placed in the planting hole in the presence of the Engineer.
- e) A circular watering basin slightly larger than the planting hole, 4 inches (100 mm) high shall be left around the plant. The bottom of the basin shall be at approximate finish grade or

slightly lower. Type 1, 2, 3, or 4 mulch shall be spread at least 2 inches (50 mm) thick in the basin leaving 3" clearance around the base of the tree or shrub.

ADD the following:

Basins of planted container material shall not be planted or seeded.

ADD: 308-2.6 Payment. When used, DG shall be included in the Contract unit price bid for "Miscellaneous Hardscape Remove and Replace with Topsoil" unless a separate Bid item has been provided.

308-4.6 Ground Cover and Vine Planting. Third paragraph; CHANGE the word "flat" to "container".

Fourth paragraph, second sentence, REVISE to read as follows:

A 2" layer of the specified mulch shall be spread over the planted areas unless specified otherwise in the Special Provisions.

308-4.7.2 Seed. REVISE as follows:

Method A - First paragraph ADD the following:

The soil shall be moist for a depth of 6" (150 mm) before planting. If not, prior to planting the soil shall be deep watered to a depth of 8" (200 mm) and allowed to dry out to the point soil is moist and will support labor and equipment without damage or undue compaction to soil and disruption of the finish grade.

308-4.7.3 Sod. Second paragraph ADD as follows:

Sod shall be installed within 24 hours after cutting. Net backing shall be removed from the sod prior to installation.

Fifth paragraph CHANGE the words "8 inches (200 mm)" to "6" (150 mm)".

308-5.1 General. ADD the following:

The installation of the irrigation system shall be in accordance with the manufacturer's instructions unless specified otherwise.

308-5.2.1 General. Fourth paragraph, ADD the following:

Irrigation mainlines, valves, and supporting equipment shall be located in the planting areas. **Unless otherwise specified** no parallel pressure pipelines shall be installed within 1' (0.3 meter) of each other.

Third paragraph, second sentence, DELETE in its entirety and SUBSTITUTE with the following:

The pipe shall be surrounded with SE 50 plaster or mortar sand material.

308-5.2.3 Plastic Pipeline. ADD the following:

Tees shall be installed horizontally at the connection with the main line.

308-5.3 Installation of Valves, Valve Boxes, and Special Equipment. Second paragraph, last sentence, DELETE in its entirety.

Third, fourth, fifth, and sixth paragraphs REVISE to read as follows:

Valves shall be the same size as the pipeline in which they are to serve unless otherwise shown on the Plans.

Isolation valves shall be installed at line depth and shall be equipped with a sleeve centered on the valve stem. Two inch and smaller globe valves shall be in PVC sleeves with locking metal lids; 2½" and larger isolation valves shall be in a 6" PVC sleeve centered in a locking valve box.

Quick coupler valves projecting above grade shall be 12" (300 mm) from curbs, pavement and walks. In ground cover and shrubbery areas, quick coupler valves shall be set 2" to 3" (50-75 mm) above finish grade. Quick couplers in lawn areas shall be installed at finished grade.

Valve boxes and pipe sleeves with caps shall be set to finish grade.

Seventh paragraph, last sentence, DELETE in its entirety.

308-5.4.1 General. Mains and laterals, including risers, shall be flushed and pressure tested before installing swing joints and sprinkler heads, after which a water coverage test shall be performed.

308-5.4.2 Location, Elevation, and Spacing. Second, third, and fourth paragraphs REVISE to read as follows:

In lawn areas, pop-up sprinkler heads shall be installed at finished grade. Lawn sprinklers shall be installed 6" (150 mm) clear of adjacent walks, curbs, paving, headers, and similar improvements.

Sprinkler heads shall be installed a minimum of 6" (150 mm) from adjacent vertical elements projecting above grade, such as walls, planter boxes, curbs and fences.

Fifth paragraph, first sentence, DELETE in its entirety.

308-5.4.3 Riser and Nozzle Line Installation. DELETE in its entirety and SUBSTITUTE with the following:

308-5.4.3 Riser Installation. To obtain optimum coverage of the area, risers shall be oriented perpendicular to finish grade.

Risers shall be Schedule 80 PVC. Sprinkler head risers shall be installed above grade when located within 24" (600 mm) of roadway paving, curbs, walks, and similar improvements and shall be of the double-swing joint type.

308-5.4.4 Sprinkler Head Adjustment. DELETE in its entirety and SUBSTITUTE with the following:

When all sprinkler heads are installed and the irrigation system is operating, each irrigation station shall be adjusted, with control valves fully open, to obtain uniform irrigation coverage.

A water audit of the irrigation system shall be required **as specified in the Special Provisions**. Sprinkler heads having adjustable pin nozzles or orifices shall have the pins adjusted to a maximum 25% radius reduction to provide uniform distribution of water over the coverage area. The Contractor shall substitute larger or smaller nozzle cores in nonadjustable sprinkler heads as directed by the Engineer.

308-5.5 Automatic Control System Installation. Second paragraph, after first sentence, ADD the following:

Each controller shall have a power ON/OFF switch, with Lockout-Tagout capability and shall have a separate circuit breaker.

Third paragraph, REVISE to read as follows:

Remote control valves shall be compatible with the automatic controller.

Fourth and fifth paragraphs, REVISE to read as follows:

Service wiring shall be installed at the minimum depth specified in SECTION 307, "STREET LIGHTING AND TRAFFIC SIGNALS" in PVC conduit from the service point to the controller. For the purpose of these specifications, service shall include all material and equipment necessary to complete the

electrical connection between the terminating point of the serving utility and the irrigation controller. A separate disconnect switch and circuit breaker shall be installed between the source of power and the controller. The minimum service wire shall be No. 12 AWG copper 600 volt type TW, TWH or TWHH or larger as required by the Contract Documents or controller manufacturer. Wire splices shall be located only in specified pull boxes and shall be made with a packaged kit approved for underground use. Pull boxes shall be set on an un-mortared brick foundation to finished grade in lawn areas and 2" above finished grade in mulch areas.

Sixth paragraph, third sentence, DELETE in its entirety.

Sixth paragraph, ADD the following:

Wire splices shall be located only in specified pull boxes spaced maximum of 300'.

Seventh paragraph after first sentence ADD the following:

The minimum insulation resistance to the ground shall be 50 megohms.

Seventh paragraph, second sentence, DELETE in its entirety.

Seventh paragraph, ADD the following:

In multiple controller installations, the common control wires shall be separate for each controller. Multiple controller enclosures shall be sized accordingly. No 110 volt wire runs shall pass from controller to controller. Each controller shall have a separate electrical service and circuit breaker through an individual raceway.

Eighth paragraph, REVISE to read as follows:

Upon completion of the Work, a legible reduced copy of the As-built irrigation Plans provided by the Engineer shall be color coded by the irrigation station, including the location of the circuit breaker feeding the controller, and laminated in plastic and mounted on the inside of each controller enclosure and shall include the location of the circuit breaker and water meter feeding the controller.

ADD the following:

Each installed remote control valve shall be coded to its parent controller.

308-5.6.2 Pipeline Pressure Test. First paragraph, last sentence, REVISE to read:

The constant test pressure and the duration of the test are as follows:

Pressurized Mains	4 hours at 125 psi (860 kPa)
Non-pressurized Laterals	2 hours at 100 psi (690 kPa)

ADD: 308-5.7 Flow Sensing Devices Installation. The flow sensing device shall be installed downstream of the backflow preventer.

ADD: 308-5.8 Rain Sensing Devices Installation. The rain sensing device shall be mounted in an approved location with open skies and away for other water sources such as the drip line of buildings or within the spray patterns of the irrigation system. The Contractor shall submit the Working Drawings showing the installation per 2-5.3, "Submittals."

ADD: 308-5.9 Pressure Regulating Valve Installation. The pressure regulating valve shall be installed downstream of the backflow preventer and shall be set to the design pressure of the system.

ADD: 308-5.10 Backflow Preventer Enclosure Installation. A Backflow Preventer Enclosure shall be required for each backflow device

ADD: 308-5.11 Booster Pumps. Booster pump installations shall be certified by the manufacturer once installed.

308-6 MAINTENANCE AND PLANT ESTABLISHMENT. First paragraph, ADD the following:

Maintenance shall be performed weekly or as directed by the Engineer and include irrigation inspection and repair, Site cleanup, pruning of groundcover, shrubs, and trees, mowing, weed control, fertilization every 6 weeks, pest and fungi control, plant replacement, and mulch replenishment.

Second paragraph, DELETE in its entirety and SUBSTITUTE with the following:

The first mowing of lawn areas shall be performed when the grass is 2 ½" (60 mm) high. The lawn height shall be maintained at 2" (50 mm) unless otherwise directed by the Engineer. Bermuda Grass shall be cut with a reel mower set to cut at 1 ¼".

Fourth paragraph, DELETE in its entirety and SUBSTITUTE with the following:

After all planting and related work has been completed in accordance with the Contract Documents; the Contractor shall request a pre-maintenance inspection from the Engineer. The Punchlist items shall be completed prior to the start of the PEP.

Fifth paragraph, DELETE in its entirety and SUBSTITUTE with the following:

After planting is completed, a field notification will be issued to the Contractor to establish the effective beginning date of the PEP. The PEP shall be for a period of 90 days permanently irrigated for plants and sod installations and 120 days for temporarily irrigated native seed and container stock plantings and seeded or stolonized turf areas. PEP may be extended by the Engineer if the planted areas are improperly maintained, appreciable plant replacement is required, or other corrective work becomes necessary. Unhealthy plant materials shall be replaced within 2 weeks from the Engineer's notification. For temporarily irrigated native plantings, the acceptance of the PEP by the Engineer shall begin the 25 month monitoring period, **unless otherwise specified.**

ADD: 308-6.1 Tree Maintenance. The Contractor shall immediately notify the Engineer if a tree appears to be or may be unstable as a result of trimming or root pruning activities.

Trimming and root pruning on any species of existing conifers or oak species shall be done only when the weather is cool during the months of November through March.

308-6.1.1 Tree Trimming. Trees shall be trimmed per ANSI A300 Standards for Tree Care Operations 1 week prior to root pruning or as directed by the Engineer. Tree trimming shall include:

- a) Removal of low branches overhanging residential streets to a height above the street grade of 14' unless otherwise directed.
- b) Removal of low branches overhanging sidewalks shall be trimmed to a height of 8' unless otherwise directed.
- c) Removal of the dead, broken, diseased, and insect-infested branches and stubs larger than ½" in diameter.

- d) Shortening the length of limbs which extend beyond the natural perimeter of an otherwise symmetrical form.
- e) Pruning end branches to lighten end weights where such overburden appears likely to cause breakage of limbs.
- f) Removal of cross limbs and water sprouts (suckers).
- g) Thinning out areas of heavy growth to reduce pressure on the tree from the wind.

Final pruning cuts shall be made without leaving a stub. Final pruning cuts shall be made in a manner to favor the earliest covering of the wound with callous growth. The wound shall be as small as practicable. The cut shall be flush within the shoulder ring area. The cambium tissues at the edge of the cut shall be alive and healthy. Extremely flush cuts which produce large wounds and weaken the tree at the cut shall not be made.

Pruning and cutting tools shall be kept sharpened to a condition that will not permit leaving a scraped cambium edge on final cuts. Such tools shall also be kept clean and free from infectious materials.

The use of climbing spurs or spike shoes shall not be permitted.

Trimming of the trees shall provide adequate clearance from obstructed street standard, globe, or sign. Trim tree limbs shall clear all adjacent structures by 5'.

In the event that high voltage aerial utility wires present a hazard to the Contractor's personnel or others near the work site, the Work shall immediately cease and the Contractor shall notify San Diego Gas & Electric. The Work shall then commence in accordance with instructions from the utility company.

308-6.1.2 Root Pruning (Re-configured sidewalk). At locations where the width of the walk will be reduced or moved over to enlarge the tree well, the Contractor shall arrange for root pruning after the existing walk has been demolished and removed and prior to installation of new walk. The Contractor shall coordinate the scheduling of root pruning within 1 week of the concrete repair work to start. Roots shall be cut at new line established by the Engineer based upon a report from a certified arborist.

308-6.1.3 Root Pruning (Sidewalk Replacement).

The Contractor shall prune the trees roots as noted in the Contract Documents. The Contractor shall coordinate the scheduling of root pruning within 1 week of the concrete repair work to start. The Work includes cutting all roots necessary for satisfactory forming for replacement sidewalk to a depth of 12" (21" on the curb side) along the edge of the new walk or curb for a distance of 10' in each direction from the trunk. If the walk will not be replaced, roots shall be cut in straight line parallel to the walk or the curb. The root cut shall not be more than 3" from edge of existing walk or curb for a length of 10' in each direction from the trunk.

Roots more than 2" in diameter shall be pre-approved for removal by the Engineer based upon a report from a certified arborist. Roots shall be cut at the nearest node to encourage roots to grow away from the walk. Root cutting shall not impact the trunk flare. Roots shall be cleanly cut 6" minimum away from new walk edge. Backfill excavated areas with Class A topsoil or decomposed granite as directed by the Engineer to existing grade and compact sufficiently to not settle when walked upon.

In order to protect existing trees, surface roots in the parkway area or planter strip shall not be damaged or removed outside of the pruning area and no construction equipment or supplies including spoils shall be placed in or upon this area.

308-6.1.4 Root Pruning (Curb Side). The Contractor shall prune the tree roots as noted in the attached **appendices** based upon a report from a certified arborist. The Contractor shall coordinate the schedule of this work within 1 week of the concrete repair work scheduled. Roots shall be cut following removal of existing curb and prior to installation of new curb when practical. The Contractor is responsible for getting a utility mark-out prior to start of work. The work includes

cutting all roots necessary to a depth of 21" inches only along the edge of the new curb line adjacent to the tree, in order to provide forming area for new curb. This shall be done for a minimum distance of 10' on the curb side of tree. In cases where curb will not be replaced, roots shall be linear cut no further than 3" from edge of existing curb for a minimum length of 10' from the tree trunk.

308-6.1.5 Equipment. Cuts shall be made with a root cutting machine such as Vemeer or Dosco Inc., or equal as approved by the Engineer. Any shredded roots shall be cut clean to nearest root node. Use of a tree stump grinder for root pruning is not acceptable.

308-6.1.6 Root Barrier. The Contractor shall install root barriers for trees within 10' of hardscape for new construction, where the root pruning and walk construction has been completed, or as directed by the Engineer. Root barriers installed on either the curb side or walk side shall be a continuous 20' in length, centered on the tree or as directed by the Engineer. Where trees requiring root barriers are 18' or less apart, the barrier shall be installed continuously between trees. The barrier shall be placed 1" below finished grade against the back of the curb or the front edge of the walk. Vertical raised ribs on barrier shall be faced toward the tree(s). The barrier shall be installed vertically, or if conditions allow, with the top inclined towards the tree. The barrier shall not be installed with the top inclined away from the tree. The root pruning trench shall be backfilled to the top of the barrier. The tree shall be inspected by the Engineer for stability prior to the backfilling of the root pruning trench.

308-7 GUARANTEE. DELETE in its entirety.

308-8 Payment. ADD the following:

Work related to tree maintenance shall be included in the Bid items as follows:

- Tree Trimming (EA)
- Root Pruning (EA)
- Root Barrier (EA)

SECTION 309 - MONUMENTS

309-2 Materials. Second paragraph, REVISE to read as follows:

Monument markers shall be as approved by the City and furnished by the Contractor.

ADD: 309-3.1 Casing and Cover for Survey Monuments. The casing and cover for survey monuments in the roadway shall be adjusted to the new grade and will be paid for at the Contract unit price for Survey Monuments.

SECTION 310 - PAINTING

310-5.6 Paint for Traffic Striping, Pavement Marking. DELETE in its entirety and SUBSTITUTE with the following:

For the purposes of replacing existing traffic striping and markings for this contract, the reference document titled "Standard Specifications, State of California, Business, Transportation and Housing Agency, Department of Transportation," shall be referred to as "Standard Specifications." Pertinent sections have been included as appendices in the Contract Documents.

310-5.6.1 General. Last paragraph, DELETE in its entirety and SUBSTITUTE with the following:

The Contractor shall furnish all equipment, materials, labor, and supervision necessary for painting traffic lanes, directional arrows, guidelines, curbs, parking lines, crosswalks, and other designated markings in accordance with the Plans, or for approved temporary detours essential for safe control

of traffic through and around the construction site. The Contractor shall within 1 Working Day or as directed by the Engineer, remove by wet sandblasting (or by other approved methods) all existing or temporary traffic markings and lines that may confuse the public. When temporary detour striping or markings are no longer required, they shall be removed prior to painting the new traffic stripes or markings.

Unless otherwise specified, payment for sandblasting, sand, and seal shall be included in the various Bid items.

SECTION 311 – SPECIAL PROTECTION MATERIALS

ADD: 311-2 EPOXY LINING INSTALLATION.

311-2.1 General. Epoxy lining shall be applied to properly prepared surfaces in accordance with 500-2, "MANHOLE AND STRUCTURE REHABILITATION." The Work shall be inspected and approved by the Engineer prior to the structure being placed into service.

311-2.2 Payment. Payment for epoxy lining materials and their installation shall be included in the price bid for the manhole, pipe, or structure to which they are applied.

PART 4 CONTROL OF MATERIALS

SECTION 400 - ALTERNATE ROCK PRODUCTS, ASPHALT CONCRETE, PORTLAND CEMENT CONCRETE, AND UNTREATED BASE MATERIAL

REVISE sentence in parenthesis to read as follows:

This Subsection shall apply unless Section 200, "Rock Materials" is specified.

400-1.1.1 General. First paragraph, ADD the following:

Third paragraph, after "ASTM C 131 ", ADD "or California Test 211".

400-4.1 General. Second paragraph, REVISE to read as follows:

The Contractor shall submit for approval, mix designs for C2 PG 64-10 (½") and B3 PG 64-10 (¾") asphalt concrete. Asphalt concrete mix designs shall be submitted to the City Materials Testing Laboratory for approval. Once the City has approved a mix design, the asphalt binder content shall be within 0.5% of identified target binder contents for each mix design submitted.

Unless otherwise specified, PG 64-10 paving grade asphalt shall be used for Type III asphalt concrete, and PG 70-10 paving grade asphalt shall be used for asphalt concrete dikes.

400-4.3 Combined Aggregates. First paragraph, ADD the following:

ASTM D2419 Test Method may be substituted for California Test 217.

Modify the sand equivalent requirements to the values in Table 400-4.3(D).

REVISE table 400-4.3 (C) for class B to read as follows:

Table 400-4.3 (C) TYPE III ASPHALT CONCRETE

Percentage Passing Sieves				
CLASS	B2		B3	
Sieve Sizes	Individual Test Results	Moving Average	Individual Test Results	Moving Average
1" (25 mm)	100	100	100	100
3/4" (19 mm)	87-100	90-100	90-100	95-100
1/2" (12.5 mm)	75-95	80-90	85-100	85-95
3/8" (9.5 mm)	50-80	60-75	60-84	65-80
No. 4 (4.75 mm)	30-60	40-55	40-60	45-60
No. 8 (2.4 mm)	22-44	27-40	24-50	30-45
No. 30 (600 µm)	8-26	12-22	11-29	14-25
No. 200 (75 µm)	1-8	3-6	1-9	3-7
Asphalt %	4.6-6.0		4.6-6.0	

ADD the following table:

Table 400-4.3(D) - Table of Sand Equivalent and Cleanness Values

Mix Size	Sand Equivalent (Min.)	Cleanness Value (Min.)
F	45 Individual	-----
D	45 Individual 50 Moving Avg.	55 Individual 60 Moving Avg.
C	50 Individual	60 Individual
B	50 Individual	60 Individual

PART 5 SYSTEM REHABILITATION

SECTION 500 - PIPELINE

500-1.1.1. GENERAL. ADD the following

The Contractor shall furnish and install, between the limits shown on the drawing, a tight-fitting sewer rehabilitation liner. The approved rehabilitation method shall be one of the following:

- a) Cured-in-Place Pipe Liner (CIPP) shall conform to 500-1.4.
- b) Deformed / Re-formed HDPE Pipe Liner shall conform to 500-1.7
- c) Folded and Re-formed PVC Pipe Liner shall conform to 500-1.10
- d) Machine Spiral Wound PVC Pipe Liner shall conform to 500-1.13

Structural requirements as they pertain to each specific material installation shall be approved by the City prior to installation.

ADD: 500-1.1.1.1 Design Criteria and Testing Requirements.

Design Criteria: Table 500-1.1.1.1(A) lists the minimum finished pipe liner wall thicknesses and minimum long-term flexural modulus for the pipeline rehabilitation methods specified herein. The thickness installed shall be increased as necessary to accommodate the existing conditions revealed in the television inspection required in 500-1.1.5, "Television Inspection" that will result in the minimum thickness specified at all locations along the rehabilitated pipe. The volume of resin used should be sufficient to fully saturate all the voids of the fabric tube material and an additional 15% shall be added to allow for change in resin volume due to polymerization and any migration of resin into cracks and joints in the original pipe, unless a higher percentage is noted herein to fill cracked and deteriorated pipelines.

TABLE 500-1.1.1.1(A) Minimum Pipe Liner Thickness (in.)

Material	C.I.P.P	H.D.P.E.	PVC Type A	PVC Type B	PVC SPIRAL WOUND
Specification	500-1.4	500-1.7	500-1.10	500-1.10	500-1.6
Minimum Long Term Flexural Modulus (psi) ¹	150,000	110,000	280,000	155,000	155,000
Nominal I.D. (in.)	Thickness	Thickness	Thickness	Thickness	Stiffness ²
6	.18	.20	.18	.18	71
8	.24	.25	.19	.24	151
10	.30	.31	.23	.30	287
12	.34	.38	.28	.37	493
15	.45	.47	.34	.46	953
18	.51	.56	.41	.50	1,640

- Notes: 1) Modulus of Elasticity is the minimum in accordance with ASTM E790, Method 1.
 2) Minimum pipe stiffness (EI) in accordance with ASTM D2412.

Structural and chemical tests shall be in accordance with the following ASTM methods:

ITEM	DESCRIPTION	ASTM METHOD
1 (a)	ID Wall Thickness	ASTM D2122-98
1 (b)	Flattening	ASTM D3034- 00
1 (c)	Pipe Stiffness	ASTM D2412-96a
2	Impact Strength	ASTM D2444- 99
3	Extrusion Quality (PVC only)	ASTM D2152-95 or ASTM F1057
4	Hardness	ASTM D2240-97
5	Tensile Strength/Tensile Modulus	ASTM D638M-96
6	Flexural Strength	ASTM D790-96a (test Method I)
7	Flexural Modulus	ASTM D790 & D2990-95

500-1.1.2 Submittals. ADD the following:

The Contractor shall submit certified test results for each item in the table above on the specified structural characteristics of the rehabilitation systems for the Engineer's approval. The Contractor shall submit bypass locations(s), bypass system sizing and a proposed equipment list to ensure that the work can be accomplished without a sewage spill; and all other documents in accordance with 804-2, "Sewage Spill Prevention and Response Plan" and 804-2.1, "Sewage Bypass and Pumping Plan" and any other applicable sections of these specifications.

ADD: 500-1.1.2.1 Pre-award Submittals. If the Bidder fails to submit the following required information or obtain approval from the City's Project Manager, the Bid may be determined by the City as non-responsive and the City may require the next lowest Bidder to submit the required information.

- a) Contractor's Experience and Past Project Documentation - Within 5 Working Days of the Bid Opening date and along with a list of jobs completed, the Bidder shall submit documentation that a minimum of 10 miles, of sewer main rehabilitation similar in scope, has been successfully installed within the last 10 years in the U.S. with a 5 years or more of documented performance record for the proposed product, and has been successfully performed by the Bidder and its personnel assigned to the liner installation and curing, utilizing the Bidder's proposed rehabilitation system for this project. The required format for this submittal has been attached to this contract. The Bidder shall identify the employees i.e., project manager, superintendent, foreman, etc.; who will be assigned to this project and provide references in the format presented in the Contract Documents. The Bidder's superintendent shall be assigned full time to this project and be present at the Site while work is being performed. Should CIPP be utilized, the documentation of the experience shall include the proposed resin and felt combination used and the installation of the proposed lateral sealing system with the pipe lining system.

- b) **Manufacturer Certification** - Within 5 Working Days of the Bid Opening date, the Bidder shall submit manufacturer's certificate(s) within the last 10 years, indicating that the supplied lining materials for sewer mains and sewer lateral connections meet the requirements of these specifications and a certificate of compliance from an independent third party lab that the proposed lining materials meet the chemical resistance requirements of 210-2, "PLASTIC LINER." The creep reduction factor used for the long term flexural modulus calculation shall be verified by testing per ASTM D2990 in the certification.
- c) **Manufacturer's License** - The installation of the sewer lining and lining of the service connections shall be performed by a contractor licensed, certified, or both by the manufacture or owner of the process. The Bidder shall submit within 5 Working Days of the Bid Opening date a copy of the license from all manufacturers for which they are licensed, certified, or both and a letter from the manufacturer(s) stating the name, address, point of contact, and telephone number for City's verification.

ADD: 500-1.1.2.2 Pre-construction Submittals. Design Calculations - Within 15 Working Days after Notice to Proceed, the Contractor shall submit to the City, design calculations for the pipe liner for approval. The design calculations shall be in accordance with the systems applicable ASTM requirements for fully deteriorated pipe. The pipe liner shall be designed to support hydraulic, soil, and live loads based on a minimum 10 feet burial depth to top of pipe and highway loading per AASHTO (HS-20). If local conditions impose greater loads, the greater loads shall be used. Local conditions may include depth greater than 10 feet, railroad loading, groundwater or other loadings. The design calculations shall be signed and sealed by a California Registered Engineer with a valid license.

ADD: 500-1.1.2.3 Submittals during Construction. The Contractor shall submit the following during construction:

- a) **Daily reports with Required Attachments** - Daily reports shall be submitted on a daily basis throughout construction. The daily report shall include the wet-out data sheet, boiler operator cooking worksheet, and temperature strip charts.
- b) **Post Cleaning Videos** - The Contractor shall televise the sewer pipe segments after the cleaning process has been completed and prior to commencing Work.

If point repairs are necessary, the Contractor shall identify the location of the proposed point repairs and submit the post cleaning video within 5 Working Days of completion of the segment cleaning and at least 5 Working Days prior to commencing the Work to obtain prior approval by the Engineer. The Engineer will review each video submittal within 10 Working Days of receiving submittal. Each video submittal shall be limited to 20 segments.

The post cleaning video for the remainder of the mainline segments shall be submitted in accordance with 2-5.3, "Submittals."

- c) The post cleaning video for service lateral launch shall be required during construction and shall be submitted within 5 Working Days of segment cleaning. The Engineer will review each video submittal within 10 Working Days of receiving each submittal. Each video submittal shall be limited to 20 segments. This video inspection shall include inspection of service lateral a minimum of 30' in length from the mainline or up to the property line unless an obstruction is encountered. If the property line clean-outs are not known to exist, service lateral video may be obtained with camera equipment designed to launch into the service lateral from the mainline or access from the private property with homeowner's permission. Each service lateral shall be identified by the Facility Sequence Number (FSN) of the mainline (when FSN are included in the Contract Documents) and the address of the property which it

serves. Failure to deliver a submittal(s) within the time identified or if a total of more than 20 segments are submitted in a single Video (CD) may result in one or more of the following:

- a. A delay of the review and approval of the submittal(s).
- b. Delay in progress payments.
- c. Require the Contractor to re-televis the sewer main segments.

Service lateral video inspection shall be submitted on a separate compact disk (CD) or hard drive.

- d) **Post-Rehabilitation Videos (Final Videos) and Red-lines** - Post-rehabilitation videos shall be submitted within 30 days of completion of the Work. This Final Video shall clearly show the condition of the liner with ends sealed at the manholes, service lateral and connection seals. The submittal of the Final Videos shall include MS Access database and marked up Field Book pages or Plans as attachments. Failure to deliver the submittal(s) within the time identified or if a total of more than 20 segments are submitted in a single Video may result in one or more of the following:

- a. A delay of the review and approval of the submittal(s).
 - b. Delay in progress payments.
 - c. Require the Contractor to re-televis the sewer main segments.
- e) **Samples** - Required samples shall be submitted to the Engineer immediately following the lining operation, according to Table 211-2(A), "Sampling, Testing, and Installation."

500-1.1.4 Cleaning and Preliminary Inspection. ADD the following:

The sewer main pipe diameters, shown on the plans, are nominal dimensions. The Contractor shall verify the actual internal pipe diameters and length of each reach prior to ordering lining materials.

500-1.1.5 Television Inspection. ADD the following requirements:

- a) The Contractor shall provide reports of inspection results of pipeline televising and conditional assessments utilizing reporting software that is compatible with City's format requirements. The reporting software shall utilize a Microsoft Access database. This information shall be in tabular form, and include but not be limited to the following information: pipeline run from upstream to downstream manhole, location of defects in feet from upstream manhole, description of the defect, and other pertinent information. The reports shall also show all service lateral connection locations. The inspection reports shall incorporate and utilize a standardized City's rating system to be provided for comprehensive evaluation of pipeline, manhole condition, or both, i.e., a standardized listing of facility condition and defect codes. Pipe condition and fault information tied to pipe location shall also be recorded in the Report.
- b) The following shall be continuously displayed on the monitors and recorded on the video:
 - i. The Facility Sequence Number (FSN) for that pipe segment,
 - ii. The direction of the survey (upstream/downstream),
 - iii. The manholes associated with the sewer main,
 - iv. Pipe size (lined on post and final videos),
 - v. Pipe material (liner type for post and final videos),
 - vi. Identified fault conditions,
 - vii. A continuous read-out of the camera distance from the starting manhole.

- c) The Contractor shall televise the pipeline following both the cleaning and rehabilitation operations, in accordance with these specifications. Post televising rehabilitated mains shall be performed in the presence of the Engineer. Digital Video Discs (i.e., DVD) shall be acceptable in lieu of VHS format.
- d) The file naming convention for final video files consists of 32 characters, including the extension. The structure includes the following: “(field book page start)-(manhole ID start)-(field book page end)-(manhole ID end)-(hhddmmyy).wmv” where the field book pages and manholes IDs are 4 characters in length and hhddmmyy signifies the hour, day, month and year of the inspection, respectively. An example filename may be “F18S-0045-F18S-0046-14150604.wmv.” Additional requirements for digital video filename have been included **in an Appendix**.
- e) The City reserves the right to re-televise any reach of the pipeline following the cleaning and rehabilitation activities, but before Acceptance by the City, to determine the existence and extent of any foreign material or obstructions such as, but not necessarily limited to, cement grout, wood, rocks, sand, concrete, or pieces of pipe, and any structural deficiencies, or sags preventing the completion of construction or other contract work. The Contractor shall notify the City via the Engineer at least 30 Working Days in advance of the anticipated date that Acceptance will be requested. If the specified advance notice is not given, Acceptance and bond release may be delayed.
- f) 10 Working Days shall be allowed for the City to review each individual video disc of each and every reach documented on that particular videodisc. In the event that any deficiencies are discovered by the Engineer or City, either by the Contractor’s televising or the City’s re-televising, 5 Working Days shall be allowed for City to judge whether the deficiencies are repairable, in place. If the judgment is made that the deficiencies are non-repairable in place, the affected portion(s) shall be reconstructed at no cost to the City.
- g) The Contractor shall not be entitled to any additional contract time due to delays resulting from the need to correct any deficiencies, either repairable or non-repairable, in place, as determined by televised inspections.
- h) Due to the nature of the work, the Contractor shall provide a self-propelled camera, capable of extended videotaping lengths and operation in remotely accessed areas without direct vehicular access. The Contractor shall televise the pipeline with maximum flow diverted from the pipeline.
- i) The system used to move the camera through the pipe shall not obstruct the camera’s view. The remote-reading footage counter device which measures the distance traveled by the camera in the pipe shall be accurate to plus or minus 1’ (0.3 meters) in 1000’ (300 meters) (+0.3m:300 meters). The Contractor shall calibrate the measuring device each day with a known distance to the satisfaction of the Engineer prior to starting the inspection and videotaping process.
- j) Television inspection shall be performed one sewer reach at a time. The sewer reach being inspected shall be isolated from the remainder of the sewer with the upstream sewage flow bypassed. If existing flows are high, pre-construction video inspection can be done with partial flow. Depth of the flow shall not exceed:
 - i. 6" - 10"(150 mm. - 250 mm) pipes - 20% of the pipe diameter.
 - ii. 12" - 24" (0.3 meters - 0.6 meters) pipes - 25% of the pipe diameter.
 - iii. 27" (0.7 meters) and up pipe - 30% of the pipe diameter.

- k) The camera shall be moved through the sewer in either direction at a uniformly slow rate by means of power cable winches or self propelled tractors at each manhole, stopping and rotating the camera head at each lateral connection, defect, or both to allow for adequate evaluation. Both pre and post video inspections shall be submitted to the Engineer.
- l) Obstructions may be encountered during the course of the internal inspection that prevents the travel of the camera. If an obstruction is not passable, the Contractor shall withdraw the equipment and begin internal inspection from the opposite end of the sewer reach. Should an additional obstruction be encountered (excluding protruding taps) after employment of the equipment from the opposite end of the sewer and no means are available for moving the television camera past the obstruction, the Contractor shall notify the Engineer, and the inspection shall be postponed until the obstruction is removed. A reverse setup, if necessary, shall be performed by the Contractor at no additional cost to the City. Should the camera get stuck in the sewer, the Contractor shall be responsible for all costs involved in extracting it. Costs related to difficulties encountered during internal television inspection are incidental to the Contract and claims, therefore, will not be considered.
- m) Defects, including but not limited to offset joints, cracks in the pipe, inflow, etc., shall be pointed out, quantified verbally and projected on CCTV video disc. The Contractor shall use the standard owner's video disc introduction, abbreviations, log sheet forms, and severity code with legend when recording the line segment information. The Contractor shall notify the Engineer of any additional damage found and obtain prior approval from the Engineer for additional point repairs.
- n) Original digital video (DVD) disc shall be submitted to and shall become the property of the City. DVD's shall be reviewed by the Engineer for focus, lighting, sound, clarity of view, and technical quality. Videos recorded while a camera has flipped over in the process of traveling and the viewing of laterals, obstructions or defects that are blocked by cables, skids or other equipment will not be accepted. Sharp focus, proper lighting, and clear distortion-free viewing during the camera operations shall be maintained. Failure to maintain these conditions will result in the rejection of the video disc by the Engineer. Any video disc not acceptable to the Engineer shall be re-televised at no additional cost to the City.
- o) Final Closed Circuit Television Inspection. The Contractor shall pre-clean the line with high pressure water jetting equipment and a sewer ball, and then perform a mandrel, air test or both, or as specified by the Engineer. For the final video inspection, the City will require a dry pipe. During the post-video inspection, the camera shall stop at each lateral connection, focus on the bottom of the opening and then make one slow clockwise observation around the perimeter of the lateral which clearly shows the quality of the connection. Then, the camera shall focus on the center of the lateral opening for a minimum of 15 seconds before moving on. If the Contractor fails to properly show and document any of the lateral openings, the Contractor will be required to re-televise that section of pipeline at no additional cost to the City.
- p) Digital Video Files. The Contractor shall provide all video (with audio) in digital file format on DVD's. The Contractor shall provide an initial submittal at the start of televising work demonstrating the typical video and audio quality to be provided for approval by the City. This submittal shall note any proposed changes to the specification listed below regarding video format, data processing, compression or other condition for review and approval by the City.
 - i. One file shall be provided for each manhole to manhole pipe segment (or for each

manhole to manhole inspection video).

- ii. The filename shall incorporate the unique facility identifier (to be provided by the City) and the date of the inspection. The facility identifier numbers will be manhole numbers, with adjacent manhole numbers identifying pipe sections. The facility identifier number(s) shall be compatible with the data input features of the reporting software (i.e. number of available input digits and/or fields).
- iii. The camera source image capture shall provide a high resolution image with a minimum of 240 x 352 pixels capture. The video shall be at 30 frames per second.
- iv. The video will be captured and compressed so as to reduce file size as much as possible while still meeting the needs of the City. The compression shall be in accordance with MPEG-1 format. The video files shall be highly compressed, resulting in an anticipated average file size of 10 MB per minute of video.
- v. The compression shall not significantly degrade the still frame quality of the video or audio signal from the original source video, as judged in a side by side viewing under normal viewing conditions.
- vi. During post-installation CCTV inspections, the Contractor shall utilize one of the following video camera systems: a rotating-lens camera (articulating head) or a pan and tilt camera. If an obstruction is encountered during post-installation CCTV inspection, the Contractor shall remove the obstruction by excavation, repair or any other means approved by the Engineer, at no additional cost to the City. After the obstruction has been removed, the Contractor shall continue with the CCTV inspection. The inspection and videotaping equipment performed shall meet 500-1.1.5, "Television Inspection." The Contractor shall use a dual recording system and submit post video inspection discs to the inspector, subsequent to recording. The Contractor shall ensure good visibility and lighting, with minimum glare and without any dark or shadowy regions appearing on the final video disc. The Contractor shall pan and tilt the camera and pause for at least 15 seconds at each lateral connection to adequately show and document that the saddle has been installed properly (for new installations) and that the lateral opening has been reestablished (for rehabilitation and lining) in accordance with 500.1.1.7.a, "Miscellaneous."
- vii. The television camera shall produce a continuously-monitored high-quality picture, capable of discerning all major and minor structural defects in the pipeline. The post-installation CCTV inspection will document all defects which may affect the integrity or the strength of the pipeline, such as cracks, roughness, "fins" or folds. The Contractor shall repair or replace all defects, at no additional cost to the City, which in the opinion of the Engineer may affect the hydraulic condition of the pipe liner.

500-1.1.6 Sampling, Testing and Installation. ADD the following:

Testing requirements: For pipeline rehabilitation systems, in addition to the CCTV inspection, the Contractor shall test 50% of rehabilitated facilities by a certified laboratory and submit test results including structural properties for the review and approval of the Engineer. Liner materials not meeting the specified minimum requirements for the specified material shall be removed and replaced with liner material meeting these specifications at no additional cost to the City. The replaced liner segments shall be televised and tested at no additional cost to the City.

500-1.1.9 Measurement and Payment. First and second paragraphs, DELETE in their entirety and SUBSTITUTE with the following:

Unless otherwise noted, no separate compensation will be paid for testing; the testing costs shall be included in the price per linear foot of pipe rehabilitation.

The unit price for rehabilitating the sewer main in the manner described shall be for the length of the liner installed in the field and shall be measured between the manholes from the wall, next to the insertion invert, to the invert wall of the downstream manhole, unless the Contractor lines thru the manhole at the City's request. Payment for the liner shall also include the cost of end seals and the reestablishment of active service connections by a remote control device per section 500-1.4.7, "Service Connections and End Seal." Television inspection after rehabilitation shall be performed in accordance with 500-1.1.5, "Television Inspection." As-built information and all other relevant submittals shall be considered incidental to the Project for payment purposes

ADD the following:

Unless otherwise noted, no separate compensation will be paid for testing; the testing costs shall be included in the price per linear foot of pipe rehabilitation.

The unit price for rehabilitating the sewer main in the manner described shall be for the length of the liner installed in the field and shall be measured between the manholes from the wall, next to the insertion invert, to the invert wall of the downstream manhole, unless the Contractor lines thru the manhole at the City's request. Payment for the liner shall also include the cost of end seals and the reestablishment of active service connections by a remote control device per section 500-1.4.7, "Service Connections and End Seal." Television inspection after rehabilitation shall be performed in accordance with 500-1.1.5, "Television Inspection." As-built information and all other relevant submittals shall be considered incidental to the Project for payment purposes

The Contractor shall be responsible for making adequate and suitable arrangements for any bypass pumping that may become necessary to prevent any backflow onto private or public property, between the time the liner is inserted, and the service re-connections have been made, tested, and approved by the City. Unless provided for, bypass pumping shall be incidental to the cost of the sewer rehabilitation.

ADD: 500-1.1.10 Sewer Main Rehab Identification. Whenever pipe(s) is(are) lined upstream, downstream, or both, a 3"x8" reflective yellow delineator as manufactured by 3M Scotchlite Brand 3200 Series or approved equal shall be mounted on the manhole wall 36" below the manhole cover as part of the Work. For rehabilitated manhole, the delineator shall be installed using a two-part epoxy, per manufacturer's specifications, compatible with polyurethane, PVC, epoxy, or any other liner material. Concrete manholes that are not lined shall have the mounting surface scuffed to sound substrate prior to installing delineator.

Payment for the identification tag shall be included in the various Bid items.

500-1.2.1 General. DELETE the first paragraph and SUBSTITUTE with the following:

This subsection specifies the point repair, replacement of host pipelines, or both. The contractor shall be responsible for repairing the pipeline where point repairs are deemed necessary in accordance with 500-1.1.2.3, "Submittals during Construction." The Contractor shall submit their plan for point repairs to the Engineer for approval prior to beginning work.

ADD: 500-1.2.7 Payment. The point repair work will be measured and paid for at the unit price bid per each point repair. Measurement will be made at the pipe and will be based on the length of pipe repaired. The Contractor will be paid for 1 point repair for each repair 8' or less in length.

The payment for Additional Point Repair shall cover point repairs (internal or external) continuous with and in addition to the basic 8' repair. Measurement will be made at the pipe and will be based on the length of the pipe repaired less the basic 8' paid under Point Repair.

500-1.4.1 General. Second sentence, DELETE in its entirety and SUBSTITUTE with the following: CIPP Liner for rehabilitation of pipelines shall use approved polyester, epoxy, or epoxy-vinyl ester-resin-impregnated flexible fabric tube.

ADD the following:

The CIPP liner shall extend the full length of the pipe reach to be rehabilitated and shall provide a structurally sound, impermeable, seamless, joint-less, close-fitting pipe, that when cured, is bonded to the host pipe.

500-1.4.2 Material Composition and Testing. ADD the following:

Tube: The tube shall be supplied by the system licensor to the licensed Contractor in accordance with ASTM F1216-98 or ASTM F1743-96 or the latest revision thereof. The side of the liner exposed to the sewer flow after inversion or pull-in is completed shall have a layer of polyurethane bonded to it, with a minimum thickness of 0.01" (0.3 mm), and shall be pinhole free. Seams and patches in the polyurethane coating shall be inspected under a black light. The tube shall be placed under a vacuum at the factory and submerged in a dye bath to verify that it is pinhole free. The Contractor shall provide proof to that effect. The felt tube shall be continuous and of sufficient length to extend the entire reach (from entry to end point) of the host pipe to be rehabilitated and to be of sufficient length to allow for restrained sample to be taken after installation. No joints or laps shall be permitted between manholes. The Contractor shall comply with all requirements specified by 500-1.1.1 and provide documentation to verify this compliance prior to installation.

Resin: The Contractor shall furnish an epoxy or epoxy vinyl ester resin in accordance with the City of San Diego Approved Material List. A compatible catalyst system shall be specified by the resin manufacturer. The resin manufacturer shall provide the Contractor with the recommended curing cycle and shall submit the same to the Engineer for approval. Certified copies of all test reports performed by the independent testing laboratory on the properties of the selected resin and on the properties of the field liner coupons, in accordance with 4-1.4 "Test of Materials" and these specifications shall be submitted to the Engineer.

500-1.4.5 Installation. ADD the following:

The installation procedures may vary with the methods of rehabilitation techniques/processes approved for the Project.

The Contractor shall submit in the same format as in 500-1.4.5.1, "Wet Out," 500-1.4.5.2, "Insertion," 500-1.4.6.1, "Cool Down," and 500-1.4.6.2, "Finished Pipe" or give detailed instructions, procedures and the steps to be followed for the installation of the CIPP even if the process is named in the specification. Such instructions and procedures shall be submitted for approval by the Engineer and shall be carefully followed.

Material, delivered to the Site, shall be accompanied by appropriate individual documentation listing physical properties, curing, or reforming temperatures and pressures.

ADD: 500-1.4.5.1 Wet Out. The Contractor shall designate a location where the felt tube will be impregnated ("wetted out") with resin. The quantity of a resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and stretching during installation, and for the loss of resin through cracks and irregularities in the host pipe according to these specifications. The calculations for the quantity of resin required shall be submitted and approved by the Engineer prior to wetting out the liner. A roller system and vacuum shall be used to uniformly distribute the resin throughout the tube to thoroughly saturate the felt tube prior to its dispatch for installation. The gap in the roller shall be verified every 50" (15 meters). The Contractor shall inform the Engineer, at least 4 Working Days in advance, to inspect the materials and the wet out procedure. A catalyst system or additive(s) compatible with the resin and tube, may be used in accordance with the manufacturer's recommendation. They shall not impair or reduce the resin's quality to withstand the minimum chemical resistance criteria.

ADD: 500-1.4.5.2 Insertion. The wetted out tube shall be transported and kept in a refrigerated truck, until it is inserted through an existing manhole by the approved technique/process of the installer or the Contractor. The Contractor shall use either an end-stop or hold-back mechanism to prevent the felt tube from extending into conduits which are not to be rehabilitated. The Contractor shall protect the Site in accordance with 7-8, "WORK SITE MAINTENANCE" and 7-9, "PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS," and shall be responsible for repairing or replacement of all existing improvements within the Site which are damaged, removed, or both as a result of the Contractor's operations, at no cost to the City.

500-1.4.6 Curing. ADD the following:

After the insertion is completed, the Contractor shall use a hot water recirculation system, capable of delivering the required heat uniformly throughout the pipeline, for a consistent cure of the resin. All City water used shall be from metered supply and paid for by the Contractor in accordance with 7-15, "WATER FOR CONSTRUCTION PURPOSES" City of San Diego Supplement Amendments. The time required for curing function of the pipeline diameter, length, and curing temperatures shall be determined by the Contractor in accordance with the resin/catalyst system of the resin manufacturer.

The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing heat source. It is required that thermocouples be placed on the top and bottom of the impregnated tube and the host pipe at the upstream and downstream manhole(s), as well as in any intermediate manhole to determine the temperatures during the resin curing process. Thermocouples shall be connected to a recording device at the heater truck to have a continuous measurement of the thermocouples on the tube as well as the intake and output water temperatures at the water heater. The recording device used to measure all temperatures shall be calibrated prior to use on the Site. The Contractor shall provide all calibration records for all equipment used on the job, upon request by the Engineer.

Remotely located thermocouple readings and the temperature of the circulating water at the downstream end of the liner away from the heater truck shall be recorded every 3 to 5 minutes until the resin begins and sustains a thermal reaction and then the interval for recording temperatures shall be every 10 minutes. The initial cure may be considered completed when the exposed portions of the felt tube appear to be hard, and the remote sensing device indicates the temperatures to be adequate, as recommended by the resin/catalyst system manufacturer, and approved by the Engineer. The Contractor shall be fully responsible for the accuracy of its work and for determining when curing has been completed to meet the specified properties. Care shall be taken during the elevated curing temperatures so as not to over stress the fiber liner. Curing temperatures and duration shall comply with data and information previously submitted and approved by the Engineer.

The cured liner shall have a smooth finish inside. Any roughness that may affect the hydraulic conditions shall be removed by sanding or trimming the “fins” or folds. Such trimming shall not change the required thickness or structural strength of the liner. The Contractor shall apply an approved sealant compatible with the material to areas where sanding has taken place or replace the pipe liner from manhole to manhole as determined and directed by the Engineer, at no additional cost to the City.

ADD: 500-1.4.6.1 Cool Down. The Contractor shall cool the hardened pipe to a temperature below 100° F (38° C), before relieving the water column. Cool water may be added to the water column while draining hot water from a small hole at the opposite end of the CIPP, so that a constant water column height is maintained until cool-down is completed. Care shall be taken in the release of the water column so that a vacuum will not develop that would damage the newly installed pipe. Coupon samples shall be obtained for testing in accordance with 500-1.1.6, “Sampling, Testing and Installation” and these specifications. The cool down process may vary depending on the installation technique.

ADD: 500-1.4.6.2 Finished Pipe. The finished CIPP shall be continuous over the entire length from manhole to manhole and shall be free from visual defects such as foreign matters, dry spots, pinholes, wrinkles and other deformities. The liner passing through or terminating in a manhole shall be carefully cut out. The cut shall be smooth and parallel to the manhole wall. The finished liner shall not protrude into the manhole over 2” (50 mm). If the manhole has been lined through, the top half of the liner pipe shall be cut off even with the top of the shelf, leaving the channel lined in accordance with 306-6, “REMODELING EXISTING SEWER FACILITIES” unless otherwise approved by the Engineer. The invert and benches shall be streamlined and improved for smooth flow. The area or annular space between the host pipe and the CIPP liner shall be sealed with the approved epoxy or other material that is compatible with the CIPP liner, and shall provide a watertight seal. The sealant system and materials shall conform to 210-2.3.3, “Chemical Resistance Test (Pickle Jar Test)” and shall be pre-approved by the Engineer. It shall meet the leakage requirements of the pressure test specified in these Contract Documents. During the warranty period, any defect specified by the Engineer which will affect the integrity or strength of the pipe liner shall be repaired at the Contractor’s expense.

Installations will not be considered complete until the lining is installed, all final cuts are finished, all channels and benches in the manholes are installed or refinished, all miscellaneous work described in the Contract documents are complete, the final video inspection is performed and as-built information is submitted to the City. No payment for installation will be made until these are completed

ADD: 500-1.4.6.3 Process Limitations. Though the installation process may be licensed or proprietary in nature, the Contractor shall not change any material, thickness, design values or procedural matters stated or approved in the submittals, without the Engineer’s prior knowledge and preapproval. The Contractor shall submit, in writing, full details about component materials, their properties, method and procedure of installation and comply with them fully during the entire course of the Project.

The City will require a continuous, uniform liner 300’ (90 meters) or greater between maintenance holes, unless otherwise shown on the plans. The City will not allow intermediate excavations for additional manholes not shown on plans.

500-1.4.7 Service Connections and End Seal. ADD the following:

After curing is complete, the Contractor shall reestablish all live service connections in accordance with 500-1.1.7, “Miscellaneous.” If the Contractor cannot reestablish a service connection as

specified above within specified Normal Working Hours, the following shall apply: The Contractor shall open all live laterals with preliminary cuts to relieve the flow the same day as the installation. The preliminary cut shall be a smooth round cut, with a minimum diameter of 1" less than the lateral's diameter. Final cuts shall be completed during Normal Working Hours within a week from the date of the liner installation, unless otherwise approved by the Engineer.

After the service has been completely established, the Contractor shall proceed with either sealing the lateral connection or lateral lining or both as called for in these specifications.

ADD: 500-1.4.9 Defect Tolerances. During post installation video recording the new liner shall be examined to determine the existence of liner defects. Liner defects include fins, wrinkles, imperfections, bulges, pinholes and material flaking, areas of uncured resin, areas of incomplete resin impregnation, inadequate pipe cleaning or material defections. A fin or wrinkle shall be defined as a defect when it penetrates inside the pipe more than 0.25" from the inside wall curvature of the new liner that is juxtaposed to the fin or wrinkle. A remedial repair or replacement action plan shall be submitted to the Engineer for review and approval for any defect prior to any corrective action. Failure to obtain Engineer's approval of the corrective plan may result in rejection of the liner and replacement with a new liner or a new pipe (if required).

ADD: 500-1.6 SERVICE LATERALS.

500-1.6.1 SERVICE LATERAL CONNECTIONS (SLC). SLC is the interface of the house sewer lateral with the main sewer. SLC to rehabilitated sanitary sewer lines shall be sealed, normally without excavation, by the installation of a resin-impregnated, flexible, felt tube or fiberglass tube installed into the existing service lateral. The tube shall form a "tee" section with a full lap inside the main pipe and shall extend continuously from the sewer main into the lateral for a minimum of 4". SLC may be a combination of "tees" or "wyes" of varying angle. The resin shall be cured to form the tube into a hard impermeable pipe-within-a-pipe. When cured, the SLC shall seal the connection of the lateral to the mainline in a continuous tight-fitting, watertight pipe-within-a-pipe to eliminate any visible leakage between the lateral and mainline and shall provide a leak-proof seal designed for a minimum 50-year life to prevent root intrusion, infiltration, and exfiltration between a liner and a host pipe.

Prior to cleaning and pre-rehab video inspection, the Contractor shall submit a detailed operational plan for the proposed cleaning of all roots inside the pipe and around the service connection for the Engineer's approval. After cleaning, the Contractor shall proceed with lining of the pipe and reinstating all live service connections. The service connection openings shall conform to the shape and the size of the inside diameter of the existing service connection. Contractor shall use a wire brush or other methods and equipment as recommended by other lining system providers, or other approved means and methods to provide a smooth opening for connecting the lateral to the newly lined pipeline.

Contractor shall trim all protruding laterals which interfere with the lining installation, as flush with the pipe interior as practicable.

500-1.6.1.2 Reference Specification. This specification references ASTM test methods which are made a part hereof by such reference and shall be the latest edition and revision thereof and shall meet the chemical resistance requirements of section 210-2.3.3, "Chemical Resistance Test (Pickle Jar Test)."

500-1.6.1.3 General Corrosion Requirements.

- a) The finished SLC product shall be fabricated from materials which when cured will be chemically resistant to withstand internal exposure to domestic sewage and shall meet the chemical resistance requirements of 210-2.3.3, "Chemical Resistance Test (Pickle Jar Test)" and Table 210-2.4.1 (A).
- b) The SLC product shall be compatible with the lining system materials utilized in the main sewer line.

500-1.6.1.4 SLC Materials.

- a) A flexible, felt tube shall be fabricated to neatly fit the internal circumference of the conduit specified by the City. Allowance shall be made for circumferential stretching during insertion.
- b) The SLC connection shall extend minimum 4" from the mainline into the lateral.
- c) The Contractor shall furnish a specially designed, unsaturated polyester or vinyl ester resin, and catalyst system compatible with the SLC process that provides cured physical strengths specified herein.

500-1.6.1.5 Physical Properties.

- a) The structural performance of the finished pipe shall be adequate to accommodate all anticipated loads throughout its design life. No cured-in-place pipe rehabilitation technology will be allowed that requires bonding to the existing pipe for any part of its structural strength.
- b) Design methods are to be derived from traditionally accepted pipe formula for various loading parameters and modes of failure. Equations shall be modified to include deformation in the shape of an oval as a design parameter. The design method shall be submitted to the Engineer for approval prior to the pre-construction meeting.
- c) The cured SLC shall conform to the minimum structural standards as listed in Table 500-1.4.2 (A) of the Standard Specifications for Public Works Construction.

500-1.6.1.6 Installation Preparation.

- a) The Contractor shall carry out its operations in strict accordance with all applicable OSHA standards and City's guidelines. Particular attention is drawn to those safety requirements involving entering confined spaces.
- b) It shall be the responsibility of the Contractor to remove internal debris out of the sewer line.
- c) Inspection of pipelines shall be performed by experienced personnel trained in locating breaks and obstacles by closed circuit television. The interior of the pipeline shall be carefully inspected to determine the location of any conditions which may prevent proper installation of the SLC into the pipelines, and it shall be noted so that these conditions can be corrected. A color video and suitable log shall be kept for later reference by the City.
- d) The Contractor, when required, shall provide for the flow of sewage around the section or sections of mainline pipe where the service lateral designated for SLC is located. The bypass shall be made by plugging the line at an existing upstream manhole and pumping the flow into a downstream manhole or adjacent system. The pump and bypass lines shall be of adequate capacity and size to handle the flow. The bypass systems shall be approved in advance by the City.

- e) It is required that the service lateral be inactive during the time of installation. This is normally accomplished by turning off the homeowner's services or requesting that the homeowner relinquish its services during the required period of installation.
- f) Line Obstructions - It shall be the responsibility of the Contractor to clear the line of obstructions that will prevent the insertion of the SLC material. If inspection reveals an obstruction that cannot be removed by conventional sewer cleaning equipment, the Contractor shall make an external point repair excavation to uncover and remove the obstruction. The Contractor shall inform the Engineer prior to the commencement of the Work.
- g) The mainline pipe opening shall be prepared to accept the SLC and the mainline rehabilitated pipe shall be maximized to obtain the best possible connection.
- h) The transition from the mainline pipe to the service lateral shall be smooth and continuous to provide adequate support for the SLC during installation and cure.

500-1.6.1.7 SLC Installation.

- a) The resin impregnated tube shall be loaded inside a pressure apparatus. The pressure apparatus, attached to a robotic device, shall be positioned in the mainline pipe at the service connection. The robotic device, together with a television camera, shall be used to align the SLC repair with the service connection opening. Air pressure, supplied to the pressure apparatus through an air hose, shall be used to invert the resin impregnated SLC into the lateral pipe. The inversion pressure shall be adjusted to fully invert the SLC into the lateral pipe and hold the tube tight to the pipe wall. Care shall be taken during the curing process not to over-stress the tube.
- b) The pressure apparatus shall include a bladder which shall inflate in the mainline pipe, effectively seating the SLC repair against the service connection.
- c) After inversion or pull in is completed, recommended pressure is maintained on the impregnated tube for the duration of the curing process. Curing method shall be compatible with the resin selected. An ultraviolet (UV) light cured, heat cured or ambient cured resin system is typically used.
- d) The initial cure shall be deemed to be completed when the SLC has been exposed to the UV light, heat source or held in place for the time period specified by the manufacturer.
- e) The Contractor shall cool the hardened SLC before relieving the pressure in the pressure apparatus. Cool-down may be accomplished by the introduction of cool air into the pressure apparatus. Care shall be taken to maintain proper pressure throughout the cure and cool-down period.
- f) The finished SLC shall be free of dry spots, lifts and delamination. The lateral SLC shall not inhibit the closed circuit television post video inspection of the mainline or service lateral pipes. Frayed ends of the SLC repair shall be removed prior to acceptance.
- g) During the warranty period, any defects which will affect the integrity of strength of the SLC shall be repaired at the Contractor's expense in a manner mutually agreed upon by the Manufacturer, City and the Contractor.
- h) After the work is completed, the Contractor will provide the City with a video disc showing the completed work including the restored conditions.

500-1.6.1.8 Clean –Up. Upon acceptance of the installation work, the Contractor shall reinstate the Site affected by its operations.

500-1.6.2 Cured In-Place Lateral Lining.

500-1.6.2.1 General. It is the intent of this specification to rehabilitate a sewer service lateral which enters a collector pipe without excavation of the entire pipe. The rehabilitation will be accomplished using a fabric or fiberglass tube of particular length and a thermoset resin with physical and chemical properties appropriate for the application. The tube is vacuum impregnated with the resin. Access to an upstream end of the service lateral is made by excavation in the public right of way. Installation of the resin-impregnated tube into the service lateral may be performed either by Type A inversion in accordance with ASTM F1216 or by Type B pull-in in accordance with ASTM F 1743, and may be performed from either the mainline or the excavated end of the lateral.

The cured-in-place liner shall extend the entire length of the lateral from the access point to the mainline. The liner shall be extended sufficiently to create a water tight seal at the main and the liner interface. Once the tube or resin composite is cured, the installation equipment shall be removed and the protruding end in the collector shall be cut using a robotic cutting device. A sewer cleanout in accordance with the City of San Diego Standard Drawing SDS-102 "Sewer Lateral Cleanout (In Driveway, Paved Alley, Sidewalk, or Other Area Subject to Traffic)" or SDS-103 "Sewer Lateral Cleanout Outside Traveled Way" shall be installed at the access point and properly backfilled.

The liner shall be extended sufficiently to create a water tight seal at the main and the liner interface.

If there is a SLC in place, then the cured-in-place lateral liner shall have a minimum overlap of 2" over the previously installed SLC sewer main lateral connection.

500-1.6.2.2 Material. The tube will consist of one or more layers of flexible needled felt, or an equivalent material. Where the tube is fabricated from non woven felt, the longitudinal and circumferential joints are made up by seal bonding. The tube will be capable of conforming to bends, off-set joints, bells, and disfigured pipe sections. The resin and catalyst system as designed for the specific application shall meet the chemical resistance requirements of 210-2.3.3, "Chemical Resistance Test (Pickle Jar Test)."

The composite of the materials above will, upon installation inside the host pipe, will exceed the minimum test standards specified by ASTM according to Table 500-1.4.2 (A).

500-1.6.2.3 Installation Procedures (ASTM F1216-98 and ASTM F1743). Standard practice for the Installation of Cured In Place Pipe by Inversion Lining or Pulled-in Place.

- a) The Property Owner of the lateral being reconstructed will be informed, and the flow stopped, for the period of reconstruction work. By-pass pumping the collector pipe may not be necessary for normal flows.
- b) The Contractor will excavate an access pit at the appropriate upstream point on the service lateral in accordance with the reconstruction length desired by the City.
- c) The Contractor will always clean and color video the lateral line immediately prior to reconstruction and determine the overall structural condition of the pipeline. All roots, debris, and protruding service connections shall be removed prior to reconstruction.
- d) The tube is inspected for torn or frayed sections. The tube in good condition will then be vacuum impregnated with the thermoset resin.

- e) No open pans or uncontrolled open-air pouring of resin should be allowed during tube saturation. All resin will be contained within the inflation bladder during vacuum impregnation and insertion. Contractor will always ensure that no public property is exposed to contamination by liquid resin compounds or components.
- f) The saturated tube along with the inflation bladder will be inserted into the installation equipment and the end closed. The entire installation equipment is placed in the pipe access pit and aligned with the exposed end of the pipe.
- g) The resin and tube are completely protected during the placement. The resin shall not be contaminated or diluted by exposure to dirt, debris, or water during the placement.
- h) The tube will be installed from the installation equipment by controlled air, water or steam pressure as in accordance with manufacturer instructions. The installation shall be stopped when the tube extends the entire length of the lateral section to be lined. The tube is held tightly in place against the wall of the host pipe by the pressure until the cure is complete.
- i) When the curing process is complete, the pressure is released and the inflation bladder reverted back into the installation equipment and removed from the pit.
- j) No barriers, coatings, or any material other than the cured tube or resin composite, specifically designed for desirable physical and chemical resistance properties, is to be left in the host pipe. Any materials used in the installation other than the cured tube or resin composite shall be removed.
- k) Any cured tube or resin composite pipe left protruding from the service connection will be trimmed back using a hydraulic-powered robotic cutting device specifically designed for cutting cured-in-place pipe made from these materials.
- l) A second color video inspection is performed to verify the proper cure of the material, the proper trim of service connection, and the integrity of the seamless pipe. A CD video recording of the inspections and a written report documenting the lateral work shall be submitted to the Engineer.
- m) The by-pass pumping system is to be removed and the sewer flows restored to normal flow conditions. The service lateral pipe is coupled together, and the excavation properly backfilled. The property owner of the service connection will be informed when the work is complete.

500-1.6.2.4 Deviations. Should pre-installation inspection reveal conditions in the sewer to be substantially different than those used in the design of wall thickness, tube construction, tube length, or resin system; then the Contractor will implement appropriate changes to correct the situation.

500-1.6.2.5 Acceptance. Upon completion, Contractor shall deliver the CD video and report to the City. The City will review the documentation and the Site to determine that the scope of work is complete and the work is satisfactory.

500-1.6.2.6 Payment. Payment for the work covered under 500-1.6, "Service Laterals" shall be made per each lateral, for cleaning and sealing of the lateral connections, lateral rehabilitation, or both.

The payment for the installation of a sewer cleanout at the access point and televising of the service laterals shall be included in the payment for lateral rehabilitation.

500-1.6.3 In-situ Point Repairs. Payment for in-situ point repairs shall be included in the bid price for in-situ point repairs and paid for in accordance with 500-1.1.9, "Measurement and Payment" and 500-1.1.10, "Additional Point Repair on Sewer Pipe."

500-1.7 DEFORMED OR REFORMED HDPE PIPE LINER.

500-1.7.1 General. ADD the following:

Deformed or reformed HDPE pipe liner shall extend the full length of the pipe reach to be rehabilitated and shall provide a structurally sound, impermeable, seamless, joint less, close-fitting pipe which is tightly adhering to the host pipe.

500-1.7.2 Material Composition. ADD the following:

Before installation, the Contractor shall provide to the Engineer appropriate individual test documentation with the physical properties and information as specified by the manufacturer for each coil of pipe. The information shall consist of: Factory test results to show compliance with ASTM D3350 Cell Classification 345434 C, D, or E and the requirements of 207-19.2, "Material Composition" reforming temperatures and pressures, a production date for each coil, and all other appurtenant information which is necessary to conform to the applicable requirements.

500-1.7.6 Installation and Field Inspection. ADD the following:

One 18" (460 mm) long restrained sample shall be taken by the Contractor from the downstream and intermediate manholes and shall be tested in accordance with ASTM D2122-98 methods to verify the minimum wall thickness as specified by TABLE 500-1.1.1(A). The H.D.P.E. shall have the following minimum values when tested in accordance with ASTM standards by an independent testing laboratory approved by the Engineer.

Table 500-1.7.6(A)

	Flexural Strength	Flexural Modulus	Tensile Strength	Tensile Modulus	Impact Resistance
ASTM Test	D 790	D 790	D 638	D 638	D 2444
U-Liner	-	110,000-160,000 psi	3,000-3,500 psi	-	pass/fail

Certified copies of all test reports performed by the independent testing laboratory, in accordance with 4-1.4, "Test of Materials" and these specifications shall be submitted to the Engineer.

Finish: The finish of the end seals shall comply with 500-1.4.6.2, "Finished Pipe." The area or annular space between the host pipe and the HDPE liner shall be sealed with the approved epoxy that is compatible with the HDPE liner. During the warranty period, any defect which will affect the integrity or strength of the liner pipe or cause a problem with service connections, due to improper finishing of channels or benches, shall be promptly repaired at the Contractor's expense.

ADD: 500-1.7.10 Payment. The unit price for rehabilitating the sewer main in the manner described shall be considered full compensation for furnishing all labor, materials, tools, equipments, apparatus and all incidentals required to do the work.

500-1.10 Folded and Reformed PVC Pipe Liner (Types A and B).

500-1.10.1 General. ADD the following:

Folded and reformed pipe liner shall extend the full length of the pipe reach to be rehabilitated and shall provide a structurally sound, impermeable, seamless, joint-less, close-fitting pipe which is tightly adhering to the host pipe. Folded and reformed PVC pipe lining consists of the reconstruction of the gravity sewer pipe by insertion of a preheated, folded PVC pipe which is then further heated and progressively unfolded and expanded against the interior surface of the host pipe. The finished PVC pipe liner, when installed and cooled, shall extend over the installation length in a continuous, tight-fitting "pipe-within-a-pipe" manner. The minimum thickness of the pipe liner shall be in accordance with 500-1.1.1, "General."

The factory test results to show compliance with ASTM D 1784 Cell Classification 13223-B and the requirements of 500-1.10.2, "Type A Folded and Reformed PVC Pipe Liner" for Type A (NuPipe®), or 12111-C and requirements of 500-1.10.3, "Type B Folded and Reformed PVC Pipe Liner" for Type B (AM-Liner®) for each coil of pipe shall be submitted to the Engineer before installation.

PVC pipe liner when installed and cooled shall have the following minimum values when tested in accordance with ASTM standards by an independent testing laboratory approved by the Engineer.

Table 500-1.10.1 (A)

	Flexural Strength	Flexural Modulus	Tensile Strength	Impact Resistance
ASTM Test	D 790	D 790	D 638	D 2444
NuPipe®	2,200 psi	280,000-320,000 psi	5,000-6,000 psi	pass/fail
AM-Liner®	1,930 psi	155,000-280,000 psi	3,500-5,000 psi	pass/fail

Certified copies of all test reports performed by an independent testing laboratory, in accordance with 4-1.4, "Test of Materials" and these specifications shall be submitted to the Engineer.

500-1.10.2 Type A Folded and Reformed PVC Pipe Liner. ADD the following to Paragraph C MATERIAL AND EQUIPMENT ACCEPTANCE:

The Contractor shall submit factory test results and the date the PVC liner was manufactured for each coil of pipe prior to installation for approval. No pipe liner shall be installed later than 6 months from date of manufacture.

ADD the following to Paragraph (f) INSTALLATION AND FIELD INSPECTION:

The Contractor shall furnish and maintain in good condition all equipment necessary for the proper execution of the work as specified. The method of installation shall be compatible with the manufacturer's recommended practices. Before installation, the pipe coils shall be tested by the Contractor in accordance with ASTM D 2122-98 to verify compliance with the minimum wall thickness.

- a) Insertion: The liner pipe shall be inserted into the existing sewer through existing manholes, without modification of the manholes.
- b) Forming: If the liner fails to form, the Contractor shall remove the failed liner and replace it with a new liner. This work shall be performed without additional costs to the City. After the line has been formed, the ends of the liner shall be cut away at both manholes.

- c) Finish: The finished liner shall comply with 500-1.4.6.2, "Finished Pipe." Any defect which will affect the integrity or strength of the liner pipe or cause a problem with the service connections, due to improper finishing of channels or benches, shall be repaired at the Contractor's expense.

500-1.10.3 Type B Folded and Reformed PVC Pipe Liner. ADD the following:

The Contractor shall submit factory test results and the date the PVC liner was manufactured for each coil of pipe prior to installation for approval. No pipe liner shall be installed later than 6 months from date of manufacture.

The Contractor shall furnish and maintain in good condition all equipment necessary for the proper execution of the work as specified. The method of installation shall be compatible with the manufacturer's recommended practices. Before installation, the pipe coils shall be tested by the Contractor in accordance with ASTM D2122-98 to verify compliance with the minimum wall thickness.

ADD: 500-1.10.7 Payment. The unit price for rehabilitating the sewer main in the manner described shall be considered full compensation for furnishing all labor, materials, tools, equipments, apparatus and all incidentals required to do the work.

ADD: 500-1.13.1 General. ADD the following:

Machine spiral wound PVC liner is intended for use in the rehabilitation of sanitary sewers without excavations. The lining process shall use a continuous PVC profile strip which is machine-wound directly into the existing pipeline from an existing manhole. The process shall be continued until the complete length of the existing pipe has been lined. PVC profile strip for machine spiral-wound liner pipe rehabilitation of existing sewers shall comply with ASTM F1697 except as modified herein.

500-1.13.6 Installation and Field Inspection. ADD the following:

Installation of machine spiral-wound PVC liner pipe rehabilitation of existing sewers shall comply with ASTM F1741 except as modified herein.

The existing pipeline shall be cleaned of any obstructions and televised in accordance with 500-1.1.4, "Cleaning and Preliminary Inspection" and 500-1.1.5, "Television Inspection." Existing live service connections shall be precisely located longitudinally, radially and in accordance with 500-1.1.7(a), "Miscellaneous" and 500-1.4.7, "Service Connections" and logged for subsequent reinstatement following insertion of the PVC strip pipe liner.

Coincident with lining forming into a spiral by the winding machine, a bead of Vulkem 116 Urethane Caulk or equal shall be injected during the winding process into the double locking elements in a sufficient amount such that upon cure it will create a watertight seal as tested on a deflected segment of fully expanded pipe.

The Contractor shall submit for the Engineer's approval the method and material composition for the end sealing and service lateral sealing material.

500-1.13.7 Service Connections. Delete this subsection and SUBSTITUTE with the following:

Service lateral reconnection shall be re-established and sealed in accordance with 500-1.1.7 (a), "Miscellaneous" and 500-1.4.7, "Service Connections."

ADD: 500-1.13.9 Material Testing. For each project, before the winding machine is placed in an insertion point, one pipe sample shall be fabricated from a reel of extruded profile strip, representing each different profile strip extrusion production run of a given profile type used on the Project. The

outside diameter of the pipe sample before expansion shall be the same as the inside diameter of the pipe it is to be inserted. The circular sample shall be of sufficient length that when tested by an independent testing laboratory approved by the Engineer in accordance with the referenced ASTM standards, it shall meet the minimum values in Table 500-1.6.3 (C) and stiffness factor requirements of Table 500-1.6.3 (A) for the type of profile used on the job.

TABLE 500-1.6.3 (C)

	Flexural Strength	Flexural Modulus	Tensile Strength	Tensile Modulus	Impact Resistance
ASTM Test	D 790	D 790	D 638	D 638	D 256
Rib-Loc or Equal	6,000 psi	400,000-440,000 psi	6,000-7,000 psi	400,000-440,000 psi	1.5

The PVC compound shall conform to the chemical resistance test in accordance with 210-2.3.3, "Chemical Resistance Test (Pickle Jar Test)." Certified copies of all test reports performed by the independent testing laboratory, in accordance with 4-1.4, "Test of Materials" and these specifications shall be submitted to the Engineer prior to installation. Sealant for interlocking segments shall be silicone sealant specifically formulated to remain flexible at 50 years after application. Product: GE Silpruf or approved equal.

ADD: 500-1.13.10 Payment. The unit price for rehabilitating the sewer main in the manner described shall be considered full compensation for furnishing all labor, materials, tools, equipments, apparatus and all incidentals required to do the work.

ADD: 500-2.4.6 Primer and Lining Materials. The primer materials for the polyurethane lining material shall be 100% solids, moisture-tolerant epoxy capable of spray application to 5 mils (127µm) thickness in one continuous coat.

The polyurethane lining material shall be 100% solids, high-build polyurethane capable of spray application to 125 mils (3175 µm) thickness in one continuous coat. The material shall meet the requirements of 210-2.3.3, "Chemical Resistance Test (Pickle Jar Test)" and 500-2.4.10, "Applicable Standards". Proof of meeting these requirements shall be provided to the Engineer for approval at least 15 days prior to commencement of work.

The epoxy lining material shall be 100 percent solids, high-build epoxy capable of spray application to 125 mils (3175 µm) thickness in one continuous coat. The material shall meet the requirements of 210-2.3.3, "Chemical Resistance Test (Pickle Jar Test)" and 500-2.4.10, "Applicable Standards." Proof of meeting these requirements shall be provided to the Engineer for approval at least 15 days prior to commencement of work.

ADD: 500-2.4.7 Lining Application. The polyurethane or epoxy lining application shall take place after the APC has cured for a minimum of 24 hours and shall be applied to all concrete surfaces from 3" (75 µm) below the low-flow water level to the base of the ring and cover. Prior to the polyurethane application, the manhole surfaces shall be primed with the epoxy primer to a thickness of 3 mils (76 µm) minimum to 5 mils (127 µm) maximum. Prior to the epoxy primer becoming tack-free, the polyurethane lining shall be immediately applied to a thickness of 100 mils (2540 µm) minimum to 125 mils (3175µm) maximum. The epoxy lining shall be applied to a thickness of 100 mils (2540 µm) minimum to 125 mils (3175 µm) maximum. The finished polyurethane or epoxy lining shall be uniform in color, fully cured, and free of pinholes, surface imperfections, and blisters.

ADD: 500-2.4.8 Test. The cured epoxy and polyurethane lining shall be subjected to adhesion (bond) testing. A minimum of three 20mm dollies shall be fixed to the lined surface of each selected manhole as determined by the City and will be pulled in accordance with ASTM D4541, utilizing an Elcometer 106 instrument. The failure shall be in the substrate concrete at no less than 300 psi. For any given lining failure, one additional manhole shall be added to the initial number of manholes to be tested. The City will further evaluate any areas detected to have inadequate adhesion. Further adhesion testing may be performed to determine the extent of potentially deficient bonded area. Repairs shall be made in accordance with 500-2.4.9, "Repair Methods."

The cured polyurethane lining shall be spark tested for pinholes, in the presence of the Engineer, with a spark tester set at 15,000 volts minimum. Pinholes shall be repaired in accordance with 500-2.4.9, "Repair Methods." The cured epoxy lining shall be spark tested for pinholes with a spark tester initially set at 12,500 volts, or 100 volts in accordance with 1 mil of film thickness applied, but may be adjusted as necessary to detect an induced holiday.

ADD: 500-2.4.9 Repair Methods. Defects in the APC shall be repaired in accordance with 303-2, "Cross References." Pinholes in the protective lining shall be marked off on surface areas containing pinholes to a point 6" (150mm) beyond all pinholes and recoated with the epoxy lining or, primed with epoxy, primer and recoated with polyurethane to a minimum additional thickness of 30 mils (762µm). Blisters, uncured lining, and surface imperfections shall be completely removed and the areas recoated with the epoxy lining or epoxy primer and polyurethane lining to a point 6" (150mm) beyond the repair areas at a minimum thickness of 100 mils (2540µm).

ADD: 500-2.4.10 Applicable Standards. APC, epoxy primer, and polyurethane or epoxy lining shall meet or exceed the requirements specified in 303-2, "Cross References" and Table 500-2.4.10 (A).

TABLE 500-2.4.10 (A)

	Polyurethane	Epoxy Primer	Epoxy
Tensile Strength	13.8	41.4	51.7
ASTM D638, Type IV, MPa (psi)	(2,000)	(6,000)	(7,500)
Elongation at Break, %			
ASTM D638, Type IV	50	5	1.5
Wear Resistance, mg. wt. loss			
Taber abrasion, S-17	60	100	115
Hardness, Shore D, Durometer			
ASTM D2240	55	75	85
Tear Resistance, kg/mm (ppi)	2.7		
ASTM D903	(150)	N/A	N/A
Peel Strength, Concrete, g/mm (pli)	125	125	N/A
ASTM D903	(7) ¹	(7) ¹	N/A
Adhesive Strength, kPa (psi)	2,760	2,760	N/A
ASTM C190 (modified) Briquet, PCC	(400) ¹	(400) ¹	N/A
ASTM D4541, Concrete, mode of failure	concrete	concrete	concrete

1. Tested as a system.

Test results shall be verified on a per job basis or as required by the Engineer.

ADD: 500-2.11 CURED-IN-PLACE MANHOLE LINER (CIPM) LINER:

500-2.11.1 General.

CIPM liner for the rehabilitation of manhole shall include the furnishing of all labor, materials, and equipment for the rehabilitation of an existing manhole with the installation of tailored fabric liner system covering the inside surface of manhole wall and shelf. The fabric shall be impregnated with epoxy resin and placed tight against the manhole wall and shelf and cured with pressurized steam.

500-2.11.2 Material Composition and Testing.

The fabric liner shall contain PVC membrane, one or more layer of polyester fleece and fiberglass reinforcement. The material shall be compatible with and capable of carrying epoxy or epoxy-vinyl-ester resin, be able to withstand installation pressure and curing temperature between 160 and 200 degree Fahrenheit. The approved epoxy shall be compatible with the application and be able to cure in the presence of hot steam. The initiation temperature for cure shall be as recommended by the resin manufacturer and approved by the Engineer. The CIPM liner shall comply with ASTM D695-96, ASTM D790-97 and ASTM C857 and shall have, as minimum, the structural properties in accordance with Table 500-1.4.2 (A).

The Contractor shall provide Field –cured samples as directed by the Engineer.

500-2.11.3 Resin and Fabric Acceptance. Resin and fabric shall comply with 500-1.4.3, “Resin and Tube Acceptance.” The fabric shall be custom tailored to fit any shape manhole wall including base, cone, and risers. The fabric shall be tailored such that, after curing, the maximum allowed pliable wrinkles do not exceed 1/2” ply. Excessive wrinkles or plies shall be subject of rejecting the rehab work. The Contractor shall assure maximum resin coverage where plies are anticipated. The minimum design thickness of the fabric shall be 20 mills PVC membrane, 10oz/yd² of polyester fleece backing and 18 oz/yd² of fiberglass backing. The minimum total composite thickness shall be 88 mills. The fabric shall be completely submerged in resin to allow for maximum absorption. Resin containment shall be the Contractor’s responsibility.

500-2.11.4 Chemical Resistance. The CIPM liner system shall comply with section 500-1.4.4, “Chemical Resistance.”

500-2.11.5 Installation. Prior to placing the liner, the manhole shall be cleaned in accordance with 500-2.4.2, “Spark Test.” The Contractor shall repair spalled or deteriorated concrete in accordance with 500-2.4.3, “Mill Gauge Test,” 500-2.4.4, “Adhesion Testing” and 500-2.4.5, “Liner Repairs.”

Installation shall be by an installer that is qualified by the liner manufacturer. The Contractor shall include the furnishing of all materials, equipment, tools, and labor as required for the rehabilitation of the manholes selected, including the installation of the interior liner. The installation of the approved liner system shall be in strict accordance with the manufacturer’s instructions. This shall include the preparation, installation, inflation, curing, and finishing operation required for the completion of the manhole rehabilitation process. Safety rules and regulations applicable laws and insurance requirements shall be observed in storing, handling, use and application of the liner materials, resins and any solvents. Ventilation shall be provided to the workers at all times.

The liner shall be installed and cured in place via controlled curing by heat and pressurization (2 to 5 psi) in the manhole to complete the curing process in less than 2 hours.

The lining of the manhole shall result in a monolithic structure to the shape and contour of the existing manhole. The liner shall be installed and bond to the interior manhole substrate and completely watertight, free of any joints or openings.

500-2.11.6 Payment. Payment for the rehabilitation of the manhole shall be included in the unit price Bid manhole rehabilitation as measured by the vertical distance between the top of shelf to the manhole cover seat.

PART 6

SECTION 600 - MODIFIED ASPHALTS, PAVEMENTS AND PROCESSES

600-3.1 General. DELETE in its entirety and SUBSTITUTE with the following:

This work shall consist of formulating a mix design, performing asphalt repair work, cleaning and preparing pavement surfaces, mixing and applying a rubberized emulsion-aggregate slurry seal, and protecting the completed slurry seal until set. Work shall be in accordance with these specifications, the dimensions and details included in the appendices, mark-outs in the field, and as approved by the Engineer.

ADD: 600-3.1.1 Preparatory Asphalt Repair Work. Prior to the application of slurry to any road segment, the Contractor shall complete all necessary repair work to the road segment in a manner satisfactory to the Engineer and in accordance with this Specification. Preparatory work shall include, but not be limited to, tree trimming, weed spray, weed abatement, crack sealing, asphalt repair (mill & paves), hump removal, miscellaneous asphalt patching, removal of raised pavement markers, removal of pavement markings, etc. No preparatory asphalt work shall be done when the atmospheric temperature is below 50 degrees Fahrenheit or during unsuitable weather.

ADD: 600-3.1.1.2 Asphalt Repair – Mill & Paves. Prior to the application of slurry, the Contractor shall repair areas of distressed asphalt concrete pavement consisting of milling or removing damaged areas of pavement to a depth of 2" for Residential streets, and 3" for all others, and then shall install new asphalt within the milled area in accordance with 302-5, "ASPHALT CONCRETE PAVEMENT" and these specifications. Asphalt concrete shall be C2-PG 64-10 in compliance with 400-4, "ASPHALT CONCRETE."

The Contractor shall remove distressed asphalt pavement to a minimum depth of 2" for residential streets and 3" for all others, either by saw cutting or milling, to expose firm and unyielding pavement; prepare subgrade as needed; and install a minimum of 2" for residential streets, and 3" for all others, of compacted asphalt concrete pavement over compacted native material as directed by the Engineer. The minimum area shall be 2' by 4'.

If, in order to achieve the minimum specified depth, the base material is exposed, the material shall be compacted to 95% relative compaction to a depth 10" below the finished grade (dig out). Compaction tests shall be made to ensure compliance with the specifications. The Engineer will determine when and where the test will occur. The City will pay for the soils testing required by the Engineer, which meets the required compaction. The Contractor shall reimburse the City for the cost of retesting failing compaction tests. If additional base material is required, the Contractor shall use Class 2 Aggregate Base in accordance with 400-2.4, "Class 2 Aggregate Base." Recycled base material shall conform to Crushed Miscellaneous Base Material in accordance with 200-2.4, "Class 2 Aggregate Base." Prior to replacing asphalt, the area shall be cleaned and tack coated in accordance with 302-5.4 "Tack Coat".

Following the asphalt placement, the Contractor shall roll the entire area of new asphalt in both directions at least twice. The finished patch shall be level and smooth in compliance with 302-5.6.2 "Density and Smoothness." After placement and compaction of the asphalt patch, the Contractor shall seal all finished edges with a 4" wide continuous band of SS-1H.

ADD: 600-3.1.1.3 Payment. The areas and quantities shown on the road segments and in appendices are given only for the Contractor's aid in planning the work and preparing Bids. The Engineer shall designate the limits to be removed and these designated areas shall be considered to take precedent over the area shown **in an Appendix** to the Contract Documents. The quantities shown in the appendices are based on a street assessment survey and may vary.

At the end of each day, the Contractor shall submit to the Engineer an itemized list of the asphalt pavement repair work completed. The list shall include the location of the work and the exact square footage of the repair.

Payment for all labor and materials for tack coating and base repairs, including any necessary base material, shall be included in the Bid item for Asphalt Pavement Repair - Mill & Paves. No payment shall be made for areas of over excavation unless previously approved by the Engineer. Asphalt Pavement Repair shall include all labor, milling, and materials needed to complete the work, and shall be paid for at the Contract unit price per ton for Asphalt Pavement Repair - Mill & Paves.

600-3.1.1.4 Miscellaneous Asphalt Patching. Miscellaneous asphalt patching shall consist of patching potholes, gutter-line erosion, and other low spots in the pavement in excess of one half (1/2) inch deep. These areas are generally smaller and more isolated than those areas in need of mill and pave. The Contractor is responsible to identify and repair any areas that may require patching, prior to the placement of slurry seal, to ensure the smoothness and quality of the finished product. Areas needing asphalt patching have not been marked out in the field.

Hot mix asphalt concrete patching shall be C2 PG 64-10 in compliance with 400-4, "ASPHALT CONCRETE."

Prior to placing the asphalt concrete patch, the Contractor shall thoroughly clean the area by removing all loose and damaged material, moisture, dirt, and other foreign matter. After the area is cleaned, the Contractor shall apply a tack coat to the entire surface that is to be hand patched in compliance with Section 302-5.4, "Tack Coat."

Following the asphalt placement, the Contractor shall roll the entire area of the asphalt patch in both directions at least twice. The finished patch shall be level and smooth in accordance with Section 302-5.6.2 "Density and Smoothness".

ADD: 600-3.1.1.5 Payment. Payment for miscellaneous asphalt patching shall be included in the Contract unit price for "RPME" and no additional payment shall be made therefore.

600-3.2.1 Rubberized Polymer Modified Emulsion. DELETE in its entirety and SUBSTITUTE with the following:

The materials for rubberized emulsion-aggregate slurry shall conform in all respects to subsection 203-5, "EMULSION-AGGREGATE SLURRY" and 600-3, "RUBBERIZED EMULSION – AGGREGATE SLURRY" and these specifications. Test reports and certifications shall be made in accordance with subsections 4-1.4, "Test of Materials," 203-1.3, "Test Reports and Certification" and 302-4.2.1, "General."

The cost of materials testing for quality assurance shall be borne by the City. The cost for any retesting as a result of the Contractor's failure to meet the requirements of these specifications shall be charged to the Contractor and deducted from payments due.

The RPME shall be a slow-set (anionic) type of emulsion as determined by the Engineer. Quick set emulsion (cationic) is not acceptable **unless specified otherwise** in the Special Provisions.

600-3.2.2 Polymer Modifier. ADD the following:

Latex modifier shall be Ultrapave 65K (Cationic), UP70 (Anionic) manufactured by Textile Rubber and Chemical Co. or equal.

600-3.2.3 Crumb Rubber. ADD the following:

100% of the crumb rubber shall be a product of recycled material from the City, if unavailable, from the San Diego County region.

600-3.2.4 Quality Requirements. When requested by the Engineer, the Contractor shall furnish, without charge, samples of the aggregate and emulsions the Contractor proposes to incorporate into the Work. Aggregate and emulsions proposed to be incorporated into the Work shall be tested by a qualified laboratory. The Contractor, at no cost to the City, shall submit to the Engineer for approval, laboratory reports of mix designs regarding the specific materials to be used on this project. Test

reports submittals shall include samples with Latex or Polymer modifiers, and samples without modifiers. Latex modifier shall be Ultrapave 65K (Cationic), UP70 (Anionic) manufactured by Textile Rubber and Chemical Co. or equal. Latex when used shall be added at the asphalt plant at a rate of 2% minimum or as modified by the Engineer.

Specimens shall contain 50, 55, 60, 65, and 70% of Rubberized Polymer Modified Emulsion for Type I, Type II, and Type III REAS. In each series of specimens with varying percentages of RPME, the percentage of water shall remain constant. The following data shall accompany each specimen:

1. % Aggregate
2. % Rubberized Polymer Modified Emulsion
3. % of Latex
4. % Water
5. Wet Track Abrasion test results

The Engineer will determine which specimens are best suited for the Project, based upon the content of RPME and water needed to produce slurry with a maximum loss of 50 grams when subjected to a Wet-Track Abrasion Test.

The Contractor, at its expense, shall then mix and spread test batches of the mix design for Type I, Type II, and Type III REAS approved by the Engineer. Batches 3-5% over and 3-5% under the approved mix design for each vehicle/mixing unit that will supply slurry for this contract will not be accepted. To the existing TABLE 600-3.2.4(C) COMPOSITION OF REAS, ADD the following:

TABLE 600-3.2.4(C)
COMPOSITION OF REAS

Aggregate Type	RPME % of Dry Aggregate Weight	Residual RPME % of Dry Aggregate Weight	kg of Dry Aggregate per L of RPME	Pounds of Dry Aggregate per Gallon of RPME
Type II Slurry Aggregate	28-35	14-18	2.90-3.60	24-30
Type III Slurry Aggregate	28-35	14-18	2.90-3.60	24-30

600-3.2.5 Aggregate. ADD the following:

The aggregate shall be from Chandler Aggregates, Inc. or equal. The aggregate shall have a specific gravity of no less than 2.60. Type I slurry aggregate will be allowed. The aggregate shall be of such character that it will not disintegrate from the action of air, water, or the conditions to be met in handling and placing and having a specific gravity of no less than 2.60. It shall have a minimum sand equivalent of 55.

To the existing TABLE 600-3.2.5(A) GRADATION OF AGGREGATES, ADD the following:

TABLE 600-3.2.5(A)
GRADATION OF AGGREGATES

SIEVE SIZE	% BY WEIGHT PASSING SIEVES TYPE II SLURRY AGGREGATE	% BY WEIGHT PASSING SIEVES TYPE III SLURRY AGGREGATE
9.5 mm (3/8")	100	100
4.75 mm (No. 4)	90-100	70-90
2.36 mm (No. 8)	65-90	45-70
1.18 mm (No. 16)	45-70	28-50
600 µm (No. 30)	30-50	19-34
300 µm (No. 50)	18-36	12-25

SIEVE SIZE	% BY WEIGHT PASSING SIEVES TYPE II SLURRY AGGREGATE	% BY WEIGHT PASSING SIEVES TYPE III SLURRY AGGREGATE
150 µm (No. 100)	10-24	7-18
75 µm (No. 200)	5-15	5-15

600-3.2.8 Mix Design Submittal. ADD the following:

The exact amounts of RPME and water to be blended with the aggregate shall be determined by laboratory and field tests as specified in 203-1.3, "Test Reports and Certification" and 302-4.2.1, "General."

The mix design shall include the weight per liter (lbs. per gal) of REAS. Calibration shall be in accordance with the International Slurry Surfacing Association (ISSA) guidelines. If the tests fail, then additional tests shall be performed at the Contractor's expense until an acceptable mix is obtained. The completed slurry shall have a minimum skid resistance of 40 when tested per the State of California Department of Transportation California Test 342.

The amount of slurry shall not vary more than 15% from the theoretic gallons as calculated by the Contractor for the same street. Actual coverage shall be verified by weight ticket calculations.

No change in the proportions of the final design mix will be permitted without the Engineer's approval. If the Contractor should change the source of supply for either the aggregate or the RPME, the mix design procedures in these specifications shall be repeated.

The selected slurry mix by the Engineer will be used to obtain field samples for tests. If necessary, the mix shall be adjusted until the final mix design is approved by the Engineer. No change in the proportions of the final design mix will be permitted without the Engineer's approval. If the Contractor should change the source of supply for either the aggregate or the RPME, the quality control procedures in these specifications shall be repeated. Deviations of more than 3% above or below the approved amount of RPME will not be allowed. The percentage of RPME is based on the dry weight of the aggregate.

600-3.4 Application of REAS. ADD the following:

Prior to the application of slurry, the Contractor shall have all utilities appurtenances and monuments covered by heavy plastic material or other means approved by the Engineer. Covers, monuments and frames are to be cleaned of slurry material by the end of the same work day. If the utility covers are not cleaned by the following day, then no additional sealing shall take place until the covers are cleaned.

REAS shall not be applied until all Preparatory Asphalt Repair Work has been completed and approved by the Engineer and in accordance with these specifications.

Type II REAS shall be applied to all streets unless otherwise specified in the Contract Documents or as directed by the Engineer.

The amount of slurry actually placed on a street shall not vary more than 15% from the theoretic gallons calculated for that street. Actual coverage shall be verified by weight ticket calculations.

The Contractor shall be fully responsible for maintenance and cleaning up of excess aggregate material and emulsion from streets and stockpile sites prior to starting work at the next site.

Due to construction conflicts or community needs that may arise, the City reserves the right to add, delete, or substitute similar road segments to those listed in the contract documents. The City reserves the right to select exact locations to be substituted. If substantial changes to the contract bid quantities result, this may allow individual bid prices to be renegotiated per Section 3-2.

To the existing TABLE 600-3.4(A) RPME APPLICATION RATES, ADD the following:

TABLE 600-3.4(A)
RPME Application Rates

Aggregate Type	Application Rate m ² /L of RPME	Application Rate sq.ft./ gallons of RPME
Type II Slurry Aggregate	0.60 to 0.74	24 to 30
Type III Slurry Aggregate	0.29 to 0.49	12 to 20

600-3.2.8 Mix Design Submittal. ADD the following:

The exact amounts of RPME and water to be blended with the aggregate will be determined by laboratory and field tests as specified in 203-1.3, "Test Reports and Certification" and 302-4.2.1, "General."

600-3.4 Application of REAS. ADD the following:

Prior to the application of slurry, the Contractor shall have all utilities appurtenances and monuments covered by heavy plastic material or other means approved by the Engineer. Covers, monuments and frames are to be cleaned of slurry material by the end of the same work day. If the utility covers are not cleaned by the following day, then no additional sealing shall take place until the covers are cleaned.

REAS shall not be applied until all Preparatory Asphalt Repair Work has been completed and approved by the Engineer and in accordance with this Specification.

Type II REAS shall be applied to all streets unless otherwise **specified in an Appendix** to the Contract or as directed by the Engineer.

The amount of slurry actually placed on a street shall not vary more than 15% from the theoretic gallons calculated for that street. Actual coverage shall be verified by weight ticket calculations.

The Contractor shall be fully responsible for maintenance and cleaning up of excess aggregate material and emulsion from streets and stockpile sites prior to starting work at the next site.

Due to construction conflicts or community needs that may arise, the City reserves the right to add, delete, or substitute similar road segments to those listed in the contract documents. The City reserves the right to select exact locations to be substituted. If substantial changes to the contract bid quantities result, this may allow individual bid prices to be renegotiated per Section 3-2.

To the existing TABLE 600-3.4(A) RPME APPLICATION RATES, ADD the following:

TABLE 600-3.4(A)
RPME Application Rates

Aggregate Type	Application Rate m ² /L of RPME	Application Rate sq.ft./ gallons of RPME
Type II Slurry Aggregate	0.60 to 0.74	24 to 30
Type III Slurry Aggregate	0.29 to 0.49	12 to 20

600-3.7 Measurement and Payment. ADD the following:

If the results of the aggregate grading, the sand equivalent, or both do not meet the requirements specified, the slurry represented by such tests shall be removed. If requested in writing by the Contractor and approved by the Engineer, the slurry may remain in place and the Contractor shall agree the payment for the RPME will be reduced by 15% of the Bid item for each failed test.

ADD: 600-3.7.1 Payment Reduction. If the results of the aggregate grading do not meet the gradation specified, the slurry represented by such test shall be removed. However, if requested in

writing by the Contractor and approved by the Engineer, the slurry may remain in place and the Contractor shall pay the City \$1.00 per gallon for such slurry left in place.

If the results of the Sand Equivalent test for aggregate do not meet the requirement specified, the slurry represented by such test shall be removed. However, if requested in writing by the Contractor and approved by the Engineer, the slurry may remain in place and the Contractor shall pay the City \$1.00 per gallon for such slurry left in place.

When the results of both the aggregate grading and the Sand Equivalent test do not conform to the requirements specified, both payments to the City shall apply. The City may deduct these amounts from any monies due, or that may become due, the Contractor under the contract.

Payment reduction for noncompliance shall also conform to 302-4.6.1, "General" and 302-4.6.2, "Reduction in Payment Based on WTAT."

600-3.2.8 Mix Design Submittal. ADD the following:

No change in the proportions of the final design mix will be permitted without the Engineer's approval. If the Contractor should change the source of supply for either the aggregate or the RPME, the mix design procedures in these specifications shall be repeated.

600-3.4 Application of REAS. ADD the following:

Prior to the application of slurry, the Contractor shall cover the utilities appurtenances and monuments by heavy plastic material or other means approved by the Engineer. Covers, monuments and frames shall be cleaned of slurry material by the end of the Working Day. If the utility covers are not cleaned by the following day, then no additional sealing shall take place until the covers are cleaned.

The City reserves the right to change the slurry locations listed within the Contract Documents. To TABLE 600-3.4(A) RPME APPLICATION RATES, ADD the following:

TABLE 600-3.4(A)
RPME Application Rates

Aggregate Type	Application Rate ft ² /gal (m ² /L) of RPME
Type II Slurry Aggregate	24 to 30 (0.60 to 0.74)
Type III Slurry Aggregate	12 to 20 (0.29 to 0.49)

ADD: PART 7

WATER WORKS

SECTION 700 – WORK INVOLVING THE CITY FORCES

700-1 CITY FORCE WORK.

700-1.1 General.

This subsection covers items of Work that involve coordination with and the services provided by the City Forces. If **Additive Alternates are included in the Bid and awarded or separate Bid item is provided** for the Contractor to provide services that are typically provided by the City Forces, the applicable specifications in this subsection shall become effective.

The City Forces, the Contractor, or both will be responsible for providing the residents with water service, by means of high-lining (i.e., temporary above ground supply lines), during construction as shown on the Plans.

The City Forces will isolate the water system, by closing valves, cutting and plugging, or both unless otherwise specified in the Contract Documents.

The City's Public Utilities Department, (619) 527-7423, shall be notified by the Contractor 30 Working Days prior to beginning of Work that involves high-lining, cutting and plugging of, or making connection to the exiting water mains. The beginning of the Work shall be scheduled at the pre-construction meeting. The information on low demand times is available from the City's Public Utilities Department.

The City is responsible for cost of the City Forces work. The Engineer will coordinate all interactions between the Contractor and the City Water Operations Division, the City Water Quality Laboratory, and other City organizations.

The Work shall be done in accordance with the applicable AWWA standards and State Department of Public Health codes.

The Contractor shall reconnect fire services and fire hydrants to the main. The Contractor shall reconnect water services larger than 2" in size to the meters.

700-1.2 High-lining.

700-1.2.1 High-lining by the City Forces.

700-1.2.1.1 Furnishing Materials. If required in the Contract Documents and a separate Bid item is provided for the Contractor furnished materials for City Force's work, the Contractor shall furnish the necessary materials for the City Forces' work as shown on the Plans to the City. The Contractor shall coordinate closely with the City Forces for the delivery of materials. The delivery location for furnished materials shall be determined by the City Forces. No materials shall be delivered to the City until the City Forces are ready to construct their work. Unless otherwise specified in the Contract Documents, the City will retain the high-lining materials at the end of construction.

700-1.2.1.2 High-Lining Removed by the Contractor. If the City Forces are not available to remove the high-lining materials, the Engineer will direct the Contractor to pickup and deliver all the City high-lining materials to Water Operations Division at: Chollas Station, 2797 Caminito Chollas, San Diego, CA 92105.

The City's Water Utilities Coordinator, (619) 527-7423, shall be contacted by the Contractor 5 Working Days before delivery of the high-lining material. After removal of high-lining materials, the Contractor shall repair all trenches created for the installation of the high-line and remove all excess temporary resurfacing materials. No high-lining materials shall be removed until the City Forces have disconnected the high-line from the water system.

700-1.2.1.3 Payment. The payment for the furnished material for the City Force high-line work shall cover materials (i.e., fittings, valves, and hardware) including delivery and unloading. The Contractor will be paid under the Bid item for "Contractor Furnished Materials for the City Forces High-line Work."

If the Contractor requests the City Forces to high-line in excess of what is shown on the Plans, those costs for high-lining will be borne by the Contractor and billed to the Contractor. Costs will be billed at the current hourly rates (loaded) according to the schedule available for the Public Utilities Department.

If high-lining by Contractor is awarded under "Additive Alternate," payment for high-lining removed by Contractor shall be included in the unit price bid for "High-lining Installation and Dismantling". Otherwise, if the City Forces install the high-line system and the Contractor is requested to remove the high-lining and deliver at the City designated location, payment shall be in accordance with the unit price bid for "High-lining Removed by Contractor" in the base Bid.

700-1.2.2 High-lining by the Contractor. When required, the Contractor shall bypass sections of the existing water main line with a temporary above-ground supply line (high-line) as shown on the Plans and in phases shown on the Schedule.

- a) The Contractor shall provide the Engineer a schedule for the high-line work at least 30 days prior to work required by the City Forces (e.g., connections or disconnects).
- b) Contractor shall phase the Project such that all structures in the area are within 1,000 feet of an active fire hydrant, measured using streets, private roads, or other routes driven by emergency vehicles. Phases are required so that the high-line provides sufficient water pressure to affected properties.
- c) The Work includes shutoff valves to isolate sections of the high-line if there is a leak or break to minimize the water service shutdowns.
- d) The high-line system shall provide continuous full service to connected water services until the new water main line is installed and in operation. The Work shall be coordinated, scheduled, and performed to minimize disruption of water services during installation and removal of the high-line system.
- e) The Contractor shall flush, disinfect, and leak test the high-line in accordance with the applicable codes and regulations prior to the City Forces' connection work to begin.
- f) The City Forces will perform all connections to high-lining system and disconnects to meters and fire hydrants.

Bacteriological sampling and testing will be performed by the City Water Quality Laboratory.

- g) The Contractor shall ensure proper installation, pressure control, or operation of the high-line to avoid damage to water users' property and related public health and safety issues.
- h) City Forces will transfer the new fire services and water services 2" and smaller to the meter after the new mains have been accepted.

- i) The Contractor shall dismantle and remove the high-line system from the Site, and restore streets, gutters, fire hydrants, and other disturbed facilities and surface improvements within 5 Working Days from the time the City Forces complete their reconnections.
- j) For parallel mains, fire services and water services larger than 2" which are not high-lined shall be connected to the meter by the Contractor only after the adjacent sections of the new main have been fully constructed, hydrostatic and chlorine residual tested, and certified acceptable by the Water Utilities Department.
- k) The Contractor shall be responsible for the extension and connections i.e., transfer of the new water services to the water meters. While making the transfers the Contractor shall, once service is interrupted, diligently pursue the required work until service has been fully restored. The Contractor shall notify each consumer affected by a water outage within 24 hours of the scheduled interruption.
- l) Cleanliness of the main shall not be compromised; otherwise, the Engineer will decide whether re-disinfection is required at the Contractor's expense.

Services shall be thoroughly flushed by the Contractor prior to restoration of water supply to customer's premises.

700-1.2.2.1 Reference Specifications, Codes, and Standards. Reference specifications, codes, and standards shall be the latest unless a specific code issue date, edition, or adoption date is specified.

- a) The Work shall be in accordance with the applicable parts of the following codes and safety regulations:
 - i. Uniform Fire Code.
 - ii. Uniform Mechanical Code.
 - iii. Uniform Plumbing Code.
 - iv. City of San Diego Water and Municipal Sewer Approved Materials List, where applicable.
 - v. State Department of Public Health (previously known as DHS), Office of Drinking Water publication titled, "Approved for Service Isolation in California Public Water Systems."
 - vi. Applicable the City, local, state, and federal codes and regulations.
- b) The Work shall be in accordance with the following commercial and industrial standards:
 - i. ANSI/AWWA C606 - Grooved and Shouldered Pipe Joints.
 - ii. ASTM A53 - Specification for Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.
 - iii. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - iv. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dipped) on Iron and Steel Hardware
 - v. ASTM A307 - Specification for Carbon Steel Bolts and Studs, 6,000 PSI Tensile Strength.
 - vi. ASTM A395 & 536 - Specification for Snap-Joint Coupling grade 65 45-15 and grade 64-45-12 coating orange enamel.
 - vii. AWWA C511 - Standard for Reduced Pressure Principle Backflow Prevention Assembly.
 - viii. AWWA C651 - Disinfecting Water Mains

700-1.2.2.2 Submittals. Prior to the start of Work, the Contractor shall submit the following in accordance with 2-5.3, "Submittals:"

- a) Itemized list of all high-lining materials to be used.
- b) Catalog data for all high-lining materials and components required.
- c) High-line system installation and detail drawings (i.e., shop and working drawings) prior to ordering or purchasing material.
- d) High-lining schedule prior to ordering or purchasing material of any part of the high-lining system.
- e) Traffic control drawings to Traffic Control Section and shall obtain a permit a minimum of 2 Working Days (5 Working Days when the work affects a traffic signal) prior to ordering or purchasing material of each phase of the high-lining system.

700-1.2.2.3 Quality Assurance. The high-lining system shall be flushed, tested for leaks, and disinfected in accordance with 700-1.1.2.7, "Start-Up Procedures" and shall pass the specified bacteriological tests prior to the City Forces making the connection.

700-1.2.2.4 Materials. Materials shall be in good condition and free of defect. The Contractor shall procure pipe, fittings, adapters, materials, and components required for a complete and operable high-lining system installation. Products and materials shall be suitable for the intended purpose, free of defects, and recommended by the manufacturer for the application intended. Hoses shall be used only at corners and curves and for connections to user's service meter(s).

- a) Pipe. Pipes shall be fabricated largely in sections of 2" Galvanized steel pipe and conform to the following:
 - i. ASTM A53 or other equal ASTM galvanized pipe standard.
 - ii. Minimum wall thickness shall be Schedule 40 (0.154").
 - iii. Pipe ends shall be machine cut or rolled for grooved couplings and fittings in compliance with ANSI/AWWA C606.
 - iv. Fittings and Couplings.
- b) Fittings shall be ductile iron. Fittings and couplings, including tees, reducing tees, laterals, wyes, elbows, pipe couplings, reducers, caps, plugs, and adapters, shall have standard flexible grooved mechanical joint connections in compliance with ANSI/AWWA C 606. Minimum pressure rating shall be 200 psig.
 - i. Housing material shall be ductile iron coated with the manufacturer's standard painting system. Coupling gasket material shall be standard Ethylene-Polypropylene Diene Monomer (EPDM) rubber.
 - ii. Couplings shall be Victaulic Style 78 or approved equal.
 - iii. The branch outlet of reducing tees shall be 1" male pipe thread. Connections of standard tees shall be grooved.
 - iv. Grooved elbows with 11¼, 22½, 45 and 90-degree bend angles will be required to configure the high-line piping system to existing bends and contours at the Site.
 - v. Manufacturers: Victaulic, Mech-Line, or approved equal.

c) Meter connections.

- i. For meters up to 1" size, the connections shall be 90-degree, long radius, brass elbow couplings with a swivel meter nut on one end and male pipe threads on the other.
 - A. The swivel meter nut shall be sized to fit the specific meter. The male pipe thread end shall be fitted with a galvanized steel "Chicago" two (2)-lug, quarter-turn, quick disconnect hose fitting-to-female pipe thread fitting.
 - B. Manufacturers: James Jones Co., Ford Meter Box Co., Inc., or approved equal.
- ii. For meters larger than 1", the connections shall be elbows with a 2-bolt Class 125 flange on one end and female pipe threads on the other.
 - A. The flange shall be sized to fit the specific meter. The female pipe thread end shall be fitted with a short pipe thread to grooved connection adapter nipple.
 - B. Alternately, the assembly can be a 2-bolt Class 125 flange-to-male pipe thread fitting, a threaded pipe elbow, and a short pipe thread-to-grooved connection adapter nipple.
 - C. Manufacturers: James Jones Co., Ford Meter Box Co., Inc., or approved equal.
 - D. Bushings, reducers, and adapters. The City Forces will be responsible for all fit-up and connections in the system. The Contractor shall provide all bushings, reducers, and adapters required to connect the high-line system to the existing fire hydrants, meters, and other facilities at the Site. Bushings, reducers, and adapters shall be provided at no additional cost to the City.
 - E. Pipe-to-hose adapters. For 1" hoses, the adapter shall be a 1", galvanized steel, "Chicago" 2-lug, quarter-turn, quick disconnect hose-to-female pipe thread fitting.
 - F. Fire hydrant-to-pipe connectors, the actual connection to the live fire hydrant to be done by the City Forces shall be a brass or bronze 1.5" female fire hydrant thread to 2" male pipe thread fitting.

d) Bolts and Fasteners. Bolts and fasteners, including bolts, nuts, and washers, shall meet the minimum requirements of ASTM A 307, and shall be hot dipped galvanized according to ASTM A 153. Bolts shall be installed with nuts face down.

e) Valves.

- i. Pipe shutoff valves shall be 2", lever handle, two-position, manual butterfly valves with grooved mechanical connections in compliance with ASTM C 606. Minimum pressure rating shall be 200 psig.

- A. Housing material shall be ductile iron coated with the manufacturer's standard painting system. Seal material shall be standard EPDM rubber.
 - B. Manufacturers: Victaulic, Mech-Line, or approved equal.
 - ii. Curb stop valves shall be bronze full-port ball valves without handles.
 - A. Seats shall be molded Buna-N rubber or other approved material. The ball shall be Teflon-coated brass or bronze. Approved plastic ball materials will be considered as substitutes.
 - B. Size shall be 1-inch with female pipe thread connections. Other sizes and end connections may be required to accommodate specific user connections.
 - C. Manufacturers: James Jones Co., Ford Meter Box Co., Inc., A. Y. McDonald Mfg. Co., or approved equal.
- f) Hoses.
 - i. User connection (Service Meters).
 - ii. For meters up to 1", the hose shall be a 1" standard general service air compressor hose with EPDM cover and 300 WP rating. End connections shall be galvanized steel, "Chicago" 2-lug, quarter-turn, quick disconnect fittings banded to the hose.
 - iii. Manufacturer: Thermoid, or approved equal.
 - iv. Curves and curbs.
 - v. Hose shall be 2" standard general service air compressor hose with EPDM cover and 300 WP rating. End connections shall be galvanized steel grooved mechanical end fittings in compliance with ASTM C606 banded to the hose.
 - vi. Manufacturer: Thermoid, or approved equal.
- g) Check Valves.
 - i. Check valves shall be swing check type with grooved mechanical connections in compliance with ASTM C606. Minimum pressure rating shall be 200 psig.
 - ii. Housing material shall be ductile iron coated with the manufacturer's standard painting system. Seal material shall be standard EPDM rubber.
 - iii. Manufacturers: Victaulic, Mech-Line, or approved equal.
- h) Backflow Preventers.
 - i. Shall meet the requirements of AWWA C511.
 - ii. Manufacturer and model shall be approved by Department of Public Health (previously known as DHS).
- i) Pressure Regulators.
 - i. If required, the Contractor shall provide 2" pipe size of bronze or ductile iron construction. Materials, coatings, seals, diaphragms, and trim shall be approved for potable water service. Connections shall be pipe threaded union couplings.

- ii. Pressure ratings and regulation ranges shall be approved for the pressure zones involved.
 - iii. Manufacturer: Braukmann or approved equal.
- j) Temporary Asphalt (Coldmix). Temporary asphalt shall be provided by the Contractor on a unit price basis.
- k) Pipe Supports.
 - i. Shall be adjustable type and fabricated from galvanized carbon steel.
 - ii. Manufacturers: Grinnell, Tolco, or approved equal.

700-1.2.2.5 Construction.

- a) Authorization. The Contractor shall not order/purchase material of any part of the high-lining system without an approved submittal and written authorization by the Engineer.
- b) Workmanship.
 - i. Contractor workmanship shall meet the accepted standards of the trades involved.
 - ii. High-lining system shall be installed and maintained such that they are neat, orderly, and leak-free, and shall be arranged to minimize interference with or present a hazard to normal usage of streets, sidewalks, driveways, and other affected facilities.
 - iii. High-lining system shall be installed in such a manner that it does not cause flooding to the surrounding area.
 - iv. Excess materials and debris shall be removed from the Site by the end of the Working Day on which they are generated.
- c) Water Users Notification. The Contractor shall coordinate the Work to minimize the duration of water shutdowns and outages.
- d) Emergency Telephone.
 - i. The 24-hour Emergency Services telephone number which shall be listed in user notifications, imprinted on safety barricades, and posted in the Work area shall be the Contractor's emergency number.
 - ii. On receipt of notification of a problem in the work area, the Contractor shall notify the Engineer, Water Operations Division (City Forces), and Emergency Services as appropriate.
- e) Repair and Maintenance.
 - i. The Contractor shall maintain the temporary asphalt ("coldmix") protective ramps for the duration of the high-line installation. Coldmix damage discovered or reported shall be repaired that same day by the Contractor.
 - ii. The Contractor shall repair and maintain the high-line system during Normal Working Hours.
 - iii. Leaks or damage shall be repaired within one hour of discovery or reporting. These repair criteria shall apply to leaks or damage arising for any reason, including vandalism and damage by Contractor personnel, equipment, or work activities.

- iv. If the repair involves any disassembly of the system, the Contractor shall disinfect and flush the affected components according to AWWA C651. This will be done in the presence of the City Public Utilities Department, Water Operations Division employee familiar with the water system.
 - v. Repair work shall be inspected and approved by the Engineer and the City Public Utilities Department, Water Operations employee familiar with the water system. At the sole discretion of the Engineer, the Contractor shall be billed separately for non-responsive or otherwise unacceptable repair and maintenance work that the City must do to restore any service.
- f) Problem Reporting. High-line system problems discovered or reported and corrective actions taken shall be documented in the Contractor's daily log and reported to the Engineer within 24 hours of the discovery or report.
- g) Traffic Control. The Contractor shall provide traffic control for all high-line work.
- h) Schedules and Timing.
 - i. The time required to furnish and install the high-lining system as a whole or in accordance with phases, shall be included in the Contract Time. The high-lining schedule shall be submitted to the Engineer for review and approval in accordance with 2-5.3, "Submittals."
 - i. The Contractor shall coordinate high-lining operations such that the Project's Schedule is not affected or delayed.
- i) Installation.
 - i. High-line Piping System.
 - ii. The high-line piping system shall be installed in accordance with the approved schedule.
 - iii. Piping phases shall be installed in loop systems, with a fire hydrant connection to the water supply at each end.
 - iv. The high-line piping system shall be inspected and approved by the City Public Utilities Department, Operations Division familiar with the water system via the Engineer prior to the City Forces charging the system with potable water or connecting to any user service line.
 - v. The high-line piping shall be installed along both sides of streets to supply water service connections to water meters. Meter service connection shall not be routed across a roadway, driveway, or other area subject to vehicular traffic.
 - vi. Shutoff valves shall be installed at each fire hydrant connection, along the piping runs at the check valve, on either side of high-line tee fittings for user connections to all meters and at the ends of cul-de-sac blind runs to permit flushing. The lever handles shall be removed from the valves to prevent unauthorized operation.
 - vii. The 2-bolt grooved couplings shall be installed with the bolts oriented as shown on Figure 5, Typical Curb Piping Runs. This orientation permits the pipe to be laid closer to the curb and is less susceptible to damage by auto traffic. To prevent damage to auto tires, coupling bolts shall not extend beyond the thickness of the nut when installed and tightened.

j) Fire Hydrant Connection.

- i. The fire hydrant connection shall be laid as shown in the Standard Drawings **or details included in the Contract Documents** for Fire Hydrant High-lining Connection. The Contractor shall make the final connection to the fire hydrant system.
- ii. The Contractor shall use elbows of different bend angles and shall be used as required to align the connection fittings parallel to the sidewalk or curb.
- iii. In situations where the fire hydrant is located such that piping must cross a sidewalk, piping shall be routed under the sidewalk surface in a 6" wide x 6" deep saw cut trench by the Contractor. The trench backfill and temporary asphalt surface shall be tamped and compacted to provide a smooth, safe surface for the duration of the high-lining by the Contractor. Routing the pipe above the sidewalk shall not be permitted.

k) User Connection (Service Meters).

- i. The Contractor shall furnish and install all material and labor as specified; the City Forces will make the actual connection for water services 2" and smaller to the system, see Standard Drawings or the **details included in the Contract Documents** for Residential User High-lining Connection.
- ii. Connection to meters sized up to 1-inch shall be as shown in or the **details included in the Contract Documents** for Residential User High-lining Connection.
- iii. Connection to meters 1½" and larger shall be made with 2" galvanized steel pipe with grooved connections.
- iv. A shutoff valve in the user connection line shall be provided at the high-line tee fitting.
- v. Meters 1½" and larger typically have 2-bolt flanged connections. Provide adapters as required to connect to specific meters.
- vi. Sidewalk crossings may be routed above ground and ramped with temporary asphalt (coldmix), see Standard Drawings or the **details included in the Contract Documents** for Driveway High-lining Crossing or Curb Ramp High-lining Crossing, Typical Driveway or Handicapped Access Crossing, and as required elsewhere in this subsection.
- vii. Field cut, groove, and fit 2" galvanized steel pipe, as required to make user connections. Sections of the high-line piping shall be cut such that service tees are as close as possible to the user meters and service connection hose or piping length is minimized.
- viii. Provide barricades and cones as required by the approved Traffic Control Plan, at service tees and meters, and as required to ensure public safety.

l) Roadway Crossing and Trenching.

- i. Portions of the high-line system should be trenched and buried by the Contractor to avoid interference with roadways and walkways.
- ii. Wherever piping is required to cross a roadway, piping shall be routed below the roadway surface in a 6" wide x 6" deep (approximate dimensions) saw cut trench. Routing the pipe above the roadway shall not be permitted.
- iii. The trench backfill and temporary asphalt surface shall be tamped and compacted to provide a smooth, safe surface for the duration of the high-lining.

m) Vehicle Driveway or Curb Ramp Crossing.

- i. Wherever the high-line piping crosses a vehicle driveway or curb ramp crossing, the piping shall be provided with temporary asphalt crossing ramps as shown in the Standard Drawings or **details included in the Contract Documents** for Typical Driveway or Curb Ramp Crossing. The temporary asphalt crossing ramps shall be tamped and compacted to provide a smooth, safe surface for the duration of the high-lining.
- ii. The temporary asphalt crossing ramps shall be constructed such that they do not interfere with normal storm water or other drainage flows, see the Standard Drawings or **details included in the Contract Documents** for Driveway or Curb Ramp High-lining Crossing. They shall not divert drainage flows either into the street or onto adjacent properties. Where required to achieve proper drainage, sections of galvanized steel piping shall be installed in the crossing ramp parallel to the high-line piping to allow for drainage past the crossing ramp. Crossing ramp installations shall be inspected and approved by the Engineer.

n) Corners and Curves.

- i. Routing the high-lining system around corners and curves shall typically be accomplished by use of 2" hose.
- ii. A 2" shutoff valve shall be installed at each end of the curve.
- iii. Portions of corners and curves with driveways or curb ramps shall be crossed with galvanized steel pipe as shown on the Standard Drawings or **the details included in the Contract Documents** for Driveway or Curb Ramp High-lining Crossing. Use of hose shall not be permitted at these crossings.
- iv. Corners and curves with bend radii too short to be accommodated by hose shall be routed with short sections of galvanized steel pipe and grooved elbows of different bend angles. Pipe shall be cut, grooved, and fitted in the field as required.
- v. Portions of the piping and fittings extending 12" or more from the curb shall be protected with temporary asphalt covering of not less than 1 inch thickness above the pipe and fittings. The temporary asphalt covering shall be sloped over the pipe and tamped in place to provide a durable surface.

700-1.2.2.7 Start-up Procedures.

a) System leak test. The Contractor shall:

- i. Charge the system with available water pressure, bleed the system of air, and verify that the entire system is filled.
- ii. Visually inspect the system for leaks and repair any leaks discovered. The system will not be accepted by the Engineer until all leaks are repaired.

b) Flushing, disinfection, and bacteriological testing of high-line mains. The Contractor shall not use the high-lining system to fill and flush any main or piping.

- i. After the high-line system is fully assembled but not hooked-up to the consumer meters, the Contractor shall flush the piping with potable water from a commercial metered source until the effluent is clear and free of dirt and debris. The Contractor shall designate the disposal of flushing water via approved methods.

- ii. The Contractor shall disinfect the high-lining piping according to AWWA C651 and 306-1.4.7, "Disinfection."
 - iii. The transport, storage, and handling of disinfection materials shall be in accordance with the CFR 1910.120, Hazardous Waste Operations and Emergency Response, CFR 49.12 Hazardous Materials Regulations, and the General Industry Safety Orders of the California Code of Regulations, Title 8, Section 5194.
 - iv. Pipeline disinfection shall be accomplished with calcium hypochlorite tablets. Short pipe sections, valves, fittings, and similar small portions of the system shall be disinfected with a solution of sodium hypochlorite.
 - v. The Contractor shall notify the Engineer 5 Working Days in advance of the date that the high-line system will be disinfected and ready for bacteriological testing.
 - vi. The City Water Quality Laboratory will collect samples from three points in the high-lining piping. Two points shall be from taps near the fire hydrant connections at each end, and one from a tap near the center of the piping.
 - vii. The City Water Quality Laboratory shall perform bacteriological testing in accordance with AWWA C651 and the City standards.
 - viii. The high-line system shall not be accepted until two consecutive sets of acceptable samples collected 24 hours apart pass tests administered by the City Water Quality Laboratory, and until written notice of acceptance is issued by the Engineer. The City Water Quality Laboratory shall be the sole judge as to whether or not the test samples meet or exceed the established test criteria.
 - ix. In the event that the high-line piping system fails to pass the required bacteriological testing, the Contractor shall re-flush and re-disinfect the lines at no additional cost to the City. Disposal of chlorinated water shall be in accordance with the City standards and regulations. Indiscriminate disposal of chlorinated water shall not be permitted.
 - x. On acceptance of bacteriological testing, the Contractor shall drain and flush the highline piping system according to AWWA C651 and the City standards. Disposal of chlorinated water shall be in accordance with the City standards and regulations. Indiscriminate disposal of chlorinated water will not be permitted.
- c) Restoration of Normal Service.
- i. Flushing of the New Main Line. The Contractor shall not flush the new main line with water from the high-line system.
 - ii. User Hook-up to the New Main Line.
 - A. Restoration of user service to the new water main line shall be done only after installation, disinfection, and bacteriological testing of the new water main line and user connection lines are completed.
 - B. Transfer of the water service 2" and smaller from the high-line to the new water main line shall be performed by the City Forces.

700-1.2.2.8 Disassembly of High-line System.

- a) Disassembly. After restoration of normal service to water users, the City Forces will disconnect high-lining from all services and the Contractor shall breakdown and fully

disassembles the high-line system and removes all high-line construction materials and debris from the area by the end of the Working Day.

- b) Restoration of Streets and Other Facilities. Street resurfacing shall be restored in accordance with 302-6, "Portland Cement Concrete Pavement" and City of San Diego Standard Drawings.

The Contractor shall remove all high-lining construction material and debris, and shall restore streets, curbs, gutters, sidewalks, fire hydrants, and other disturbed facilities in accordance with 7-9, "Protection and Restoration of Existing Improvements."

- c) High-Lining Materials. High-lining materials shall become the Contractor's property.

700-1.2.2.9 Figures. The Contractor shall refer to the high-lining details **provided in the Contract Documents as appendix** or included as Standard Drawings.

ADD: 700-1.2.2.10 Payments. The Bid items provided for high-lining Work shall include Work described in 700-1.1.2, "High-lining By the Contractor" broken down as follows:

- a) The linear foot price bid item, "Furnishing High-lining Materials" shall be full compensation for furnishing all materials necessary to install the high-lining system.
- b) The unit price Bid item for "High-Lining Installation and Dismantling" shall be full compensation for installing the high-lining system complete and dismantling it after the restoration of normal service to water users. Connections including water services larger than 2" in size and restoration of the surface improvements shall be included in the payment for "Hi-Lining Installation and Dismantling."
- c) Payment to the Contractor for maintaining and repairing the high-lining system during construction shall be included in the lump sum Bid item for "High-Lining Maintenance and Repairs."

700-1.3 Connections to the Existing System. The City Forces will be responsible for making connections and cut-ins to the existing mains as part of the base Bid

700-1.3.1 Connection by the City Forces. The Contractor shall provide the following information about the existing main prior to connections:

- a) condition of pipes and valves,
- b) type of fitting and joint to which connection is to be made (i.e., construction), and
- c) alignment, elevation, and location of the water main and any fittings.

700-1.3.1.1 Connection by the City Forces When the City Forces Cut and Plug the Existing Main. The City Forces will isolate existing water main to be replaced by the Contractor. The City forces will mark location, elevation, and approximate grade of existing main on street pavement and record this information for future use. The Contractor shall consult and cooperate with the City Forces' supervisor to ensure that the information is understood and used correctly. Within the last 10' to be installed by the Contractor, the Contractor shall install bends, concrete thrust blocks, short lengths of pipe, and other appurtenances necessary to put the new installation on line and grade with the existing pipe.

700-1.3.1.2 Connection by the City Forces When the City Forces Do Not Cut and Plug the Existing Main. The Contractor shall expose the existing water main where the Work ends. The Contractor shall be responsible for determining the elevations of existing water mains and fittings. The new water main shall be at the same grade and parallel alignment as the existing main and shall be no

farther away than 1' from the existing water main. At the option of the Contractor, one or two bends or pulled joints may be used to accomplish this condition.

700-1.3.1.3 Furnishing Materials. If required in the Contract Documents, the Contractor shall furnish the necessary materials for the City Forces' connection and cut-in work as shown on the Plans to the City. The Contractor shall coordinate closely with the City Forces for the delivery of materials. The delivery location for furnished materials shall be determined by the City Forces. No materials shall be delivered to the City until the City Forces are ready to construct the work, unless otherwise specified, in writing, by the City.

700-1.3.1.4 Pavement Restoration for the City Forces Final Connection. Within 10 days following the completion of the City Forces final connection work in the Project areas, the Contractor shall remove all temporary resurfacing, saw cut trench area, compact sub-grade and restore affected area with permanent resurfacing in accordance with 302-6, "Portland Cement Concrete Pavement" and City of San Diego Standard Drawings.

700-1.3.1.5 Payment. The payment for the furnished material for the City Force connection and cut-in work shall cover materials (i.e., fittings, valves, and hardware) including delivery and unloading. The Contractor will be paid under the lump sum Bid item for "Contractor Furnished Materials for Connection and Cut-in Work."

Payment for preparatory work in advance of connections by the City Forces in accordance with 700-1.2.1, "High-lining by the City Forces" shall be included in the various Bid items. Traffic control, saw cutting the trench area, trench cap, and other spot repairs in the vicinity of disturbed area at each restored connection shall be included in the Bid item for Pavement Restoration for the City Forces Final Connection. Asphalt Overlay and Slurry Seal will be paid under separate Bid items.

700-1.3.2 Connections to the Existing System by Contractor. **If required in the Contract Documents,** the Contractor shall make the connection (e.g., cut-in or tie-in) to the existing mains as shown on the Plans, specified in these specifications, and in conformance with the latest standards of the State Department of Public Health. Suitable facilities shall be provided for proper de-watering, drainage, and disposal of all water removed from the excavation or pipe without damage to adjacent property. The Contractor shall locate and expose the existing water main to which connection is to be made prior to and in advance of trenching to permit grade and alignment changes as approved by the Engineer. In the presence of the Engineer, the Contractor shall make the connections as shown on the Plans regardless of the condition or location of the existing pipe, valves, and fittings with no adjustment in the Contract Price.

700-1.3.2.1 Submittals. The Contractor shall submit Shop Drawings, Working Drawings, and other information in accordance with 2-5.3, "Submittals" prior to start of construction. The drawings and other descriptive material shall adequately describe procedures to be used, materials to be furnished, any related pipeline appurtenances, and trench shoring. Each drawing shall be reproducible original, accompanied by 6 copies of all submitted information. If approved without change or correction, two approved copies will be returned to the Contractor. The Contractor shall include all time impacts of protecting the existing water main in the Schedule.

700-1.3.2.2 Utility Verification for Connection Location. The Contractor shall pothole the location and depth of all utilities to verify that there are no utility conflicts prior to excavation.

The Contractor shall locate and confirm vertical and horizontal locations, size, shape, materials, and construction of existing water mains.

700-1.3.2.3 Notification. The Contractor shall coordinate the Work with the City Water Operations Division, and notify them a minimum of 20 Working Days after Engineer's approval of the

Contractor's work plan and prior to any shutdown of an existing water line. The City Forces will perform all shutdowns including trial and final attempts. If the Contractor fails to keep the field appointments, the City will bill the Contractor for scheduled the City Forces waiting or standby time and the costs incurred by the City for notification of its customers for the subsequent appointment.

The Contractor shall schedule the requested shutdowns during low demand times. Generally, only residential areas may be done during the day. The Contractor shall coordinate with the City to determine the appropriate times. The City may refuse to shutdown a water line on the day requested by the Contractor due to operational circumstances (e.g.,, business cannot withstand a shutdown of water at that time; other connecting distribution systems are out of service at the same time; high water demands by customers; etc.) or other reasonable concerns by the City. No request will be denied for arbitrary reasons.

700-1.3.2.4 Connection. Prior to connecting to existing water main, the Contractor shall have all personnel, material and equipment ready to connect the fittings to the existing mains to minimize the shutdown time. The City may postpone or reschedule any shutdown operation if for any reason the City determines that the Contractor is improperly prepared with competent personnel, equipment, or materials to proceed with the connection.

When installing a cut-in tee or cross with new valves, reducers or other fittings that is larger than the existing pipe, the new assembly shall be installed at the depth sufficient to allow the valve to remain below the subgrade of the street which may necessitate lowering the existing pipe. The Contractor shall provide and install the entire assembly -including valves and reducers and any other hardware necessary under the City inspection in accordance with the City Standards. The entire assembly shall be connected in advance to facilitate the expedient connection to existing main.

The Contractor shall clean and disinfect the connection in accordance with AWWA C651.

Shutdown of the water main and Connection operations shall be coordinated with high-lining operation; be performed at low demand times; and shall be completed within timeline specified in these specifications.

If Connection operation exceeds the time as identified in the notification, causes health and safety risks, or disruption of water service to the consumers, the Contractor shall notify the Engineer and the City's Station 38 at (619) 527-7660 for assistance to provide potable water and temporary high-lines to restore water to the affected consumers. The City will order necessary corrective measures. All costs for corrective measures shall be paid by the Contractor. The Contractor shall be liable to the City for the costs of the City Forces' emergency work.

If existing valves leak excessively during the isolation of the segment that is going to be connected, the City Forces will assist in reducing the influx of water, but the Contractor shall use methods at the Contractor's disposal to work with the resulting leakage.

700-1.3.2.5 Quality Control. The Work shall not proceed if the Engineer is not present during all connection work.

The Contractor shall take every precaution necessary to prevent trench water, dirt or debris from entering the water mains during connection operation.

Under no circumstances shall a non-disinfected water main, which cannot be isolated and *has not passed bacteriological test*, be connected to an existing disinfected water main.

700-1.3.2.6 Operation of Valves. Valves on the City's water system shall be cleaned and operated only by the City Forces.

700-1.3.2.7 Repair. If the water main is damaged by the Contractor's operations, the Contractor shall immediately notify the Engineer and the City Water Operations Division representative or the City's Station 38. The City Forces will perform all necessary repairs to the water main. The Contractor shall be liable to the City for the costs of the City Forces' repair work.

700-1.3.2.8 Compaction. Compaction of the trench after installation of the water main shall be in accordance with 306-1.3, "Backfill and Densification."

If the Work is located within a different jurisdiction or agency other than the City or private easement, compaction shall meet the requirements of that agency or utility granting the permit.

700-1.3.2.9 Surface Restoration. The Contractor shall restore to its original grade and condition surfaced areas in accordance with 7-9, "Protection and Restoration of Existing Improvements." After final connection is completed, the Contractor shall remove all temporary resurfacing, compact sub-grade and restore affected area with permanent resurfacing in accordance with 302-6, "Portland Cement Concrete Pavement" and City of San Diego Standard Drawings.

700-1.3.2.10 Payment. "Connection to The Existing System by the Contractor" e.g., cut-in or tie-in will be paid under Bid unit prices for connections, and cut-ins. Potholing for and protecting the water main while performing the Work, information essential for making the connection, coordination of Work with the City Forces, scheduling impacts, community outreach, materials and traffic control shall be included in the payment.

700-1.4 Cut and Plug of the Existing System by the Contractor. The cut and plugs of the existing system as part of the base Bid shall be performed by the City Forces.

700-1.4.1 Submittals. The Contractor shall submit Shop Drawings and Working Drawings and other information for the cut and plug of existing water mains in accordance with 2-5.3, "Submittals." The submittals shall adequately describe procedures to be used e.g., distance from valves, thrust blocks for temporary plugs, materials to be furnished, any related pipeline appurtenances, and trench shoring. Each drawing shall be reproducible original, accompanied by 6 copies of all submitted information. If approved without change or correction, 2 approved copies will be returned to the Contractor. The Contractor shall include in the Schedule all time impacts to protect the existing water mains.

The Contractor shall submit traffic control drawings and obtain the Traffic Control Permit from the City prior to the start of the cut and plug and reconnection operations.

700-1.4.2 Utility Verification for Cut & Plug location. The Contractor shall pothole the location and depth of all utilities to verify that there are no utility conflicts prior to excavation.

The Contractor shall locate and confirm vertical and horizontal locations, size, shape, materials, and construction of existing water mains.

700-1.4.3 Notification. The Contractor shall coordinate the Work with the City Water Operations Division, and notify them a minimum of 20 Working Days after Engineer's approval and prior to any shutdown of an existing water line. The City Forces will perform all shutdowns. If the Contractor fails to keep the field appointments, the City will bill the Contractor for scheduled the City Forces waiting or standby time and the costs incurred by the City for notification of its customers for the subsequent appointment.

The Contractor shall make every effort to schedule the requested shutdowns during low demand times. Generally, only residential areas may be done during the day. The Contractor shall coordinate with the City to determine the appropriate times. The City may refuse to shutdown a water line on

the day requested by the Contractor due to operational circumstances (i.e., business cannot withstand a shutdown of water at that time; other connecting distribution systems are out of service at the same time; high water demands by customers; etc.) or other reasonable concerns by the City. No request will be denied for arbitrary reasons.

The City will prepare and distribute written notification within 24 hours prior to starting Work on any water main that will affect service. This notification shall be delivered door-to-door to water users in the affected area. A copy shall be delivered to the Engineer on the date of user notification.

700-1.4.4 Cut and Plug. Prior to cutting and plugging of the existing water mains, the Contractor shall have all personnel, material and equipment ready to minimize the shutdown time. The Contractor shall organize its workforce, equipment and operations to protect the existing water main while performing the Work.

Shutdown of water main and cut and plug operations shall be coordinated with high-lining operation and shall be performed during low demand times and shall be completed within the timeline specified in these specifications.

After isolation of the mains, rarely does a completely dry condition exist in the trench. If the existing valves leak excessively once closed *during the isolation of the segment that is going to be plugged*, the City Forces will assist in reducing the influx of water if needed, however, the Contractor shall use methods at Contractor's disposal to work with the resulting leakage.

If the cut and plug operation exceeds the time as identified in the notification or causes health and safety issues or disruption of water service to the consumers, the Contractor shall notify the Engineer and the City's Station 38 at (619) 527-7660 for assistance. The City will provide potable water and or temporary high-lining to restore water to the affected consumers. The City will order necessary corrective measures.

All costs for corrective measures shall be paid by the Contractor. The Contractor shall be liable to the City for the costs of the City Forces' emergency work.

700-1.4.5 Quality Control. Cut and plug of existing water lines shall be completed in a safe, neat and orderly manner. Plugs shall be capable of blocking pressurized main with no visual leak detected. The Contractor shall take every precaution necessary to prevent trench water, dirt or debris from entering the water mains during the capping or plugging operation.

Cut and plug shall not proceed if the City Public Utilities Department, Operations Division employee familiar with the water system is not present for the duration of the cut and plug.

After the cut and plug operation, the water main and appurtenances shall be disinfected and field tested by the Contractor in accordance with the latest edition of AWWA C651. The City Forces shall take water samples for bacteriological tests in accordance with Section 7 of the AWWA C651.

Suitable facilities shall be provided for proper de-watering, drainage, and disposal of all water removed from the excavation or pipe without damage to adjacent property.

700-1.4.6 Operation of Valves. Valves on the City's water system shall be cleaned and operated only by the City Forces.

700-1.4.7 Repair. If the water system is damaged by the Contractor's operations, the Contractor shall immediately notify the Engineer and the City's Station 38 or the City Water Operations Division representative. The City Forces will perform all necessary repairs to the water main. The Contractor shall be liable to the City for the City Forces' work for the repair.

700-1.4.8 Surfaced Areas Impacted by Cut & Plug. Surfaces impacted by excavation to install cut and plug shall be temporarily backfilled, resurfaced, and maintained.

700-1.4.9 Payment. Locating e.g., potholing for and protecting the water main, coordination of Work with the City Forces, any scheduling impacts, community outreach, materials, and traffic control shall be included in the unit price payment for “Cut and Plug of The Existing System by the Contractor.”

ADD: PART 8

ENVIRONMENTAL WORKS

SECTION 800 - REVEGETATION, MAINTENANCE, AND MONITORING

800-1 GENERAL. The Contractor shall execute and submit the revegetation supplemental agreement, **when included in the Contract Documents.** The revegetation items of Work shall commence within 30 days after the Work that necessitated revegetation is completed. The provisions of Section 2-3, "SUBCONTRACTS" shall not apply to the independent supplemental agreement. The Contractor shall limit staging areas to described areas as identified in the Biological Technical report included in the Contract Documents.

The Contractor shall comply with Section 212, Section 308, except as follows:

800-1.1 Terms and Responsibilities. For the purpose of these specifications the following definitions and descriptions of the responsibilities shall apply:

Maintenance Contractor - The Maintenance Contractor may be the same as the Revegetation Contractor, or a Subcontractor, and will be responsible for maintenance of the revegetation and erosion control areas for **the specified PEP.** The Maintenance Contractor shall be familiar with the identification of native species associated with upland and wetland vegetation communities and non-native invasive plants. The Maintenance Contractor shall be responsible for training all personnel working in the revegetation sites. Maintenance staff shall be familiarized with revegetation site boundaries, the requirements of the revegetation effort as it pertains to them, and any other information that the Project Biologist determines is necessary for the success of the revegetation program (such as protection of existing adjacent upland and wetland areas).

Project Biologist – An independent third party consultant employed by the Contractor and responsible for overseeing the Protection of Existing Biological Resources requirements and the entire revegetation program. Project Biologist shall review and become familiar with the Contract Documents and shall function under the direction of the Engineer. The Project Biologist shall be an individual or team of individuals with 4-year degree(s) in botany, ecology, landscape architecture, or a related field, and demonstrated experience in habitat restoration and shall be qualified to perform United States Fish and Wildlife Service protocol focused sensitive species surveys as outlined in the biological technical report, CEQA document, local, state and federal resource agency permits or a combination for the Project.

The Project Biologist may be hired by the City **if so specified in the Special Provisions.**

Revegetation Plan – **Unless specified otherwise,** for Design-Build contracts, document prepared or commissioned by the City and included in these specifications containing important details on procedures, materials, and methods applicable to protection of biological resources, revegetation, and maintenance and monitoring of installed vegetation.

When specified, Revegetation Plans prepared by the Contractor for native habitat creation or restoration shall be consistent with the City's Biology Guidelines.

Revegetation Contractor - The planting and plant establishment work shall be performed by a qualified Revegetation Contractor to implement the Revegetation Plan. Revegetation Contractor shall possess a landscape Contractor's and pest control advisor license and shall submit references for at least 3 successful native habitat revegetation projects in Southern California. The Revegetation Contractor shall demonstrate knowledge of native vegetation and invasive weed identification as a

part of the Bid. The Revegetation Contractor shall implement the Revegetation Plan in accordance with recommendations provided by the Project Biologist and Engineer.

Plant Supplier – Plant Supplier may be the Project Biologist or a qualified native plant nursery. The plant supplier shall have at least 2 years experience in the propagation of native plants and shall be responsible for prorogating containerized plant materials according to these specifications.

Seed Supplier - Seed Supplier may be the Project Biologist or Plant Supplier and shall have at least 2 years experience collecting seeds for restoration projects. The Seed Supplier shall hold a valid Department of Agriculture Inspection Certificate. The Seed Supplier shall be responsible for collecting necessary quantities of specified plant species for use in the revegetation phase of the Project.

MHPA - Multiple Habitat Planning Area administered by the City's Multiple Species Conservation Program (MSCP). The MHPA is a system of environmentally sensitive areas given special protections. Work conducted within the MHPA typically requires monitoring by the Project Biologist and may require additional special studies or impact avoidance measures. If such monitoring, studies, or avoidance measures are necessary, they will be outlined in the attached CEQA Document, Site Development Permit (if applicable), and these specifications.

ESL – Environmentally Sensitive Lands administered by Development Services Department through the environmentally Sensitive lands regulations and the City's Landscape Regulations. ESL are steep slopes and native habitat given special protection. Work conducted within the MHPA typically requires monitoring by the Project Biologist and may require additional special studies or impact avoidance measures. Refer to CEQA Document and Site Development Permit (if applicable) for more information.

Plant Establishment Period (PEP) – The specified period of time required to ensure successful initial establishment of revegetation materials installed as directed in the specifications and drawings. The PEP begins upon acceptance of installation of all revegetation and extends for the specified plants establishment period. PEP shall be 120 days for native plants **unless otherwise specified**. The PEP may be extended under specific circumstances as described elsewhere in these specifications.

Revegetation Maintenance and Monitoring Period - Period of time required to ensure long-term establishment and health of revegetation; 25 months for native plants, **unless otherwise specified**. Maintenance and Monitoring begins upon completion and acceptance of the PEP and extends for the specified duration. It can be extended if the revegetation does not meet specific performance criteria in accordance with the Revegetation Plan.

800-1.2 Environmental Protection. Before the commencement of any clearing, grubbing, or excavations in unpaved areas, including ESL as defined in City Municipal Code 143.01, canyons and other vegetated areas, all responsible parties under control of the Contractor shall meet at the Site with the Engineer and the Project Biologist. The Contractor shall ensure prior to any activity at the Site that all laborers are aware of the limits of construction areas.

800-1.3 Protection of Biological Resources. The Contractor shall protect existing landscape, existing native vegetation, and other biological resources within the limits of Work, except as specifically authorized to the contrary by the plans, the CEQA Document, the attached local, state, and federal resource agency permits, or other written notice from a person or agency possessing proper authority to grant such an exception.

The Contractor may remove or damage existing vegetation only within the "Construction Corridors" identified in the Plans. The Project Biologist shall approve and locate the "Construction Corridors" in

the field. If the Contractor damages areas outside the identified "Construction Corridor", the Contractor shall mitigate, in accordance with the direction of the Project Biologist and Engineer, the areas at the Contractor's own expense. The Contractor shall protect all ornamental landscape and existing native vegetation outside the limits of the work. The Contractor shall restrict all construction activities to within the construction corridor.

Additional vegetation protection, scheduling, noise abatement, and wildlife survey requirements may be imposed by CEQA Document or by local, state, and federal permits. The Project Biologist shall flag or otherwise make known such areas and requirements and shall further coordinate Work to comply with these requirements. The Contractor shall comply with all biological resource protection requirements. Any damages to biological resources given specific protection by these specifications, the drawings, the CEQA Document, or by local, state, and federal permits shall be mitigated in accordance with the direction of the Project Biologist and Engineer at the Contractor's own expense and shall be submitted for approval by any local, state, or federal agency permitting authority associated with those impacts.

No work shall be allowed within or adjacent, as determined and directed by the Project Biologist, to environmental sensitive habitats between March 1 and August 15 due to the breeding season of the Coastal California Gnatcatcher.

800-1.4 Construction Fencing. The Contractor shall construct orange construction fencing at all locations along the construction corridors.

The Contractor shall be responsible to schedule with Engineer and Project Biologist the flagging of the construction corridor prior to any clearing and grubbing activity. After approval of the corridor alignment, Contractor shall install construction fence and shall maintained it until the end of the specified PEP.

Construction fencing minimum 3' high shall be staked at no less than 10' on center with metal fence stakes. At each stake, the material shall be fastened with a minimum two nylon ties.

800-1.5 Responsibilities and Restrictions for the Contractor While Working in Unpaved Areas. Construction personnel shall be instructed about the sensitive nature of the native vegetation and constraints within the vegetated areas identified on the Plans. Construction-related activity outside of the public right-of-way of local roads including equipment travel and access, clearing, grubbing, grading, excavation, stockpiling of excavated material and storage of materials, and equipment and vehicles shall be limited exclusively to the construction corridor area identified on the Plans and shown or described in attached environmental documents and permits.

The following restriction shall apply to all construction areas located within vegetated areas:

- a) No construction personnel or associated vehicles shall enter vegetated areas that are outside the "Construction Corridor" as identified on the Plans and as defined by the Project Biologist and the Engineer.
- b) Pets shall be prohibited on construction site(s) and within adjacent habitat areas.
- c) Catering trucks are prohibited on the construction site(s).
- d) For concrete washouts refer to water pollution control sections of theses specifications.
- e) Litter, including tobacco debris, is prohibited on the construction site(s), either from construction or food packaging.
- f) Equipment maintenance and pollution control shall be in accordance with 7-8, "WORK SITE MAINTENANCE."
- g) Access to the construction site(s) shall be via the Construction Corridor.
- h) To reduce the possibility of fire, NO SMOKING shall be allowed within vegetated areas.

- i) Additional restrictions may be listed in the attached CEQA Document, local state or federal permits, or a combination.

800-1.6 Construction Access Routes. Vehicle and equipment traffic shall enter into the canyons or other unpaved areas only through the routes identified as “Construction Corridor” on the Plans. Within the “Construction Corridor” surface vegetation can be removed only as necessary to provide safe passage for foot and vehicle traffic. Care shall be taken to minimize impacts to existing vegetation to the extent possible. Where possible, vegetation shall be trimmed, pruned or mowed instead of being cleared. Impacted areas shall be revegetated according to the Contract Documents. The Contractor is advised to investigate Site conditions prior to Bid.

800-1.7 Biological Monitoring and Reporting. This work shall include all the required biological monitoring and reporting of the revegetation and erosion control from the notice to proceed from the Engineer through acceptance of the PEP, in accordance with these special provisions, as shown on the Plans, as directed by the CEQA Document and other acquired local, state, and federal permits, and the direction of the City’s Mitigation Monitoring Section (MMC) via the Engineer.

800-1.7.1 General. The Contractor shall retain a qualified Project Biologist. Verification documentation shall be provided and approved by the MMC at least 30 days prior to the pre-construction meeting. If the proposed Project Biologist is not approved, the Contractor shall submit and obtain approval of an alternate City qualified Project Biologist at no additional cost to the City prior to start of Work.

Once approved, the Project Biologist shall attend the pre-construction meeting to present and coordinate the revegetation portion of the Project.

800-1.7.2 Monitoring. The Project Biologist shall observe and monitor all construction activities in or near vegetated areas or other areas designated or regulated as sensitive biological resources by City, state, and federal regulations or described as such by the **attached Biological Technical Report** provided in the Contract Documents. During the construction work in the sensitive areas, the Project Biologist shall be present on Site no less than two days per week to insure fulfillment of all of the monitoring requirements referenced in these specifications and its attachments. The Project Biologist shall be on-site at the start of all excavation and clearing and grubbing activities.

The Project Biologist shall be responsible for monitoring all construction activities in unpaved areas for compliance with these contract documents and its attachments. The Project Biologist shall report directly to the Engineer any Site conditions, work activity, or work product that does not comply with the Contract Documents or its attachments.

The Project Biologist shall have authority and responsibility, via the Engineer, to immediately stop Work in areas of the Project where an unpermitted take of existing biological resources would result from continued construction activity.

Project Biologist shall be the sole authority for interpreting, via the Engineer, the intent of the attached Biological Technical Report, Revegetation Plan, CEQA Document, Site Development Permit, or both and resource agency permits, and these specifications, and shall provide specific information and direction to the Engineer and the Contractor as shown in the Contract Documents.

The Project Biologist shall attend and perform the Site observation visits in accordance with these specifications.

800-1.7.3 Reporting. The Project Biologist shall prepare letter reports to document the completion of plant and seed installation and the PEP. The letter reports shall include review of the clearing, grubbing, and installation activities as well as the success standards at the end of the PEP and any

remedial measures required. Any additional reporting requirements contained in the CEQA Document, Site Development Permit, or both and the Revegetation Plan shall be followed.

800-1.8 Landscape Materials. Materials selected by the Contractor shall be subject to written approval of the Engineer via Project Biologist.

800-1.8.1 Topsoil. The Project Biologist shall be responsible for determining suitability of on-site topsoil material.

If import of topsoil is determined to be necessary, Class B topsoil from a comparable site shall be provided and tested, as specified. Topsoil source and quality shall be approved by the Project Biologist prior to delivery. Topsoil shall be weed free upon delivery, or treated as specified for weed eradication. Topsoil stockpiled for later installation shall not be stockpiled for more than 1 week.

800-1.8.2 Soil Fertilizing and Conditioning Materials. No fertilizers shall be used for any aspects of planting and seeding unless directed otherwise by the Project Biologist.

800-1.8.3 Mulch. Mulch shall be created from on-site vegetation as approved by the Project Biologist. If additional mulch is required, straw mulch shall be derived from rice plant material; animal bedding straw shall not be used. Straw shall be un-decayed, clean, and free of weeds, seeds, and debris.

800-1.8.4 Seed. The Contractor shall arrange for seed material to be collected for the sole purpose of the Project in accordance with these specifications, the CEQA Document, Site Development Permit, state or federal permits, and the Revegetation Plan. The Contractor shall submit copies of seed collection contract agreement, within 30 days of Contract award, to the Engineer for approval by the Project Biologist.

Seed shall be collected from the Project vicinity (e.g., within a 10-mile radius) unless otherwise approved by the Engineer. Imported seed shall be ordered, delivered, separated, and containerized by species.

Application rate (lbs./acre) for seed types not conforming to specified percentage of seed purity and germination shall be approved by Project Biologist using current test results. Increased seed quantities shall be furnished by Contractor at Contractor's cost.

The Contractor shall be responsible for providing seed that has been pre-treated by known methods for each species of plant seed as defined in Emery, Dara E. 1988, Seed Propagation of Native California Plants, Santa Barbara Botanic Garden, Santa Barbara California.

800-1.8.5 Container Stock. The Contractor shall arrange for native container stock (e.g. 1 gallon, etc) plants in all areas except access paths, to be selected for installation at the appropriate rate (e.g. 2000 plants per acres, etc), for the Project in accordance with these specifications, the CEQA Document, Site Development Permit, state or federal permits, or combination, and the Revegetation Plan. The Contractor shall submit copies of container stock selection contract agreement, within 30 days of Contract award, to the Engineer for approval by the Project Biologist.

Container stock shall be collected from a Plant Nursery (e.g., within a 25-mile radius) qualified to propagate and care for native plant species.

800-1.8.6 Installation, Maintenance, and Reporting. The Contractor shall arrange for installation of temporarily irrigated native hydroseed or container stock as recommended by the Engineer and Project Biologist. Installation shall occur during rainy season (Oct 1-Feb 15), and Project Biologist shall recommend a temporary irrigation plan. For installation outside rainy season (Feb 15-Oct 1) the Contractor shall first obtain the Engineer's approvals, and a comprehensive irrigation plan must be

developed and submitted for review by the Contractor. All installation timing, watering and maintenance, as well as schedules shall be submitted to the Engineer for approval prior to installation.

Project Biologist shall prepare and submit an installation, and progress reports about success criteria (e.g. plants installed, health, 20% PEP install coverage, 30% end of PEP cover, and 40% at the end of revegetation), and recommendations to City Engineer bi-weekly during PEP, every 3 months after PEP acceptance by City Engineer to ensure success of revegetation.

800-1.8.5 Samples. The Contractor shall furnish seed samples upon request by the Engineer or the Project Biologist. Samples of ½ lbs of each species or premixed seed mix may be requested by the Project Biologist or the Engineer, to be drawn at time of delivery to mitigation site.

800-1.8.6 Substitutions and Changes. The Contractor shall submit to the Engineer and the Project Biologist any proposed substitutions or other changes to the specified seed mixes or container plant lists in accordance with 4-1.6, "Trade Names or Equals" at least 30 days prior to installation.

800-1.8.7 Plant Inspection. The Revegetation Contractor shall notify the Engineer and the Project Biologist 48 hours before each plant delivery so the plants can be inspected and approved prior to planting.

- a) Nomenclature: The scientific and common names of plants herein specified conform to the approved names given in the following references:
 - i. Native Plants – "The Jepson Manual: Higher Plants of California" third printing (1996) published by the University of California Press, and updates in the Jepson Online Interchange of California Floristics, University of California Berkeley.
 - ii. Non-native Plants – "Western Garden Book" published by Sunset Publishing, Menlo Park, CA. for Non-native plants.
- b) Labeling: Each group of plant materials delivered on-site shall be labeled clearly as to species and variety. Patented plants (cultivars) required by the plant list shall be delivered with a property plant patent attached.
- c) Quality and Size: Plants shall be Vigorous, healthy, well-proportioned as verified by the Engineer and Project Biologist. Plants which are even moderately "overgrown," or are showing signs of root girdling, decline, lack of vigor or stunted growth, shall be subject to rejection. Plants larger in size than specified may be used with the approval of the Engineer and the Project Biologist. The use of larger plants shall not cause any change in Contract Price.
- d) The PEP as specified in the Special Provisions shall not begin until all plants have been installed and the Work has been accepted by the Engineer.

800-1.8.8 Erosion Control Matting. Erosion control matting shall be BonnTerra America, Coconut Straw Blanket #CS2, (70% straw, 30% coconut fiber), or approved equal. Matting shall be anchored in accordance with manufacture recommendations.

800-1.8.9 Herbicides and Pesticides. Post-emergent herbicide for all areas shall be Rodeo, Round-Up, or approved equal. All other herbicides, insecticides, fungicides or other similar chemicals shall be approved by the Project Biologist prior to use.

800-1.9 Clearing.

800-1.9.1 General. Prior to the removal of any vegetation, the Project Biologist shall verify that proper limits of the “construction corridors” identified on the Plans have been established in accordance with these specifications. Clearing shall include the removal of existing vegetation by various methods, selected by the Contractor and approved by the Engineer and Project Biologist. Clearing be coordinated closely with the Project Biologist.

Clearing shall include or be coordinated with the following items as shown on the Plans or specified in these specifications.

- a) Protection of environmental and built features to remain.
- b) Furnishing and applying water.
- c) Dust control.
- d) Erosion control.
- e) Maintenance of project appearance.
- f) Trash removal.

Clearing shall be done at the locations identified as the Construction Corridor on the Plans. Removal of vegetation shall not occur without the Project Biologist on-site. The Project Biologist shall monitor all site clearing activities.

800-1.9.2 Salvage Existing Topsoil and Vegetation. The existing vegetation that will be removed during clearing of the Site shall be retained on Site and ground to a coarse grade of mulch for re-application in accordance with this subsection. Prior to any excavation that may occur, vegetation shall be removed and the top 8” of topsoil shall be removed and stored. Existing native and approved non-native habitat vegetation removed during clearing at the Site shall be retained on Site and ground to a coarse grade of mulch for re-application of top soil placement. Cleared vegetation from areas of the Project classified as ruderal or otherwise dominated by invasive exotic weed species, as determined by the Project Biologist, shall not be included in the mulch and shall be properly disposed of.

800-1.9.3 Storage of Existing Topsoil and Vegetation. The salvaged topsoil and mulch shall be stored at a location on Site that is approved by the Engineer or Project Biologist. The mulch shall be stored separately from the topsoil. The top soil and the mulch shall be protected and covered by means of an impermeable tarp.

Creation of brush piles from cut and brushed vegetation that may become a fire hazard shall be avoided. Vegetation not to be salvaged shall be chipped, cut, or both to pieces of 12” or less, then removed, buried, or adequately spread out as directed by the Project Biologist.

800-1.10 Watering. Alternative irrigation methods e.g., water truck and hand watering shall be approved by the project Biologist and the Engineer.

800-2 LICENSED REVEGETATION CONTRACTOR.

800-2.1 General. When required in the Contract Documents a licensed Revegetation Contractor shall be retained to perform landscape and revegetation work. The Contractor shall submit prior to pre-construction meeting copies of the Revegetation Contractor’s landscape contractor license and pest control advisor license and show references for at least 3 successful native habitat revegetation projects in Southern California. This submittal shall demonstrate the Revegetation Contractor’s knowledge of native vegetation and invasive weeds.

800-2.2 Site Observation Visits for Revegetation. Observations by the Engineer and Project Biologist shall be for the purpose of determining compliance with Plans and Specifications, intent, workmanship, and clean-up. The Contractor or its authorized representative shall be on Site at the time of each site observation. Observations, clearances, inspections or other activities required or necessary for protection of environmental resources are separate from this work and are described in Part 1, the CEQA Document, and acquired local, state, and federal permits.

The Contractor shall receive written notification of all deficiencies and shall correct all deficiencies prior to requesting the next inspection. Each deficiency shall be resolved by the Contractor no later than 72 hours after oral or written notification from the Engineer. Failure to comply in the time frame defined herein will result in suspension of contract payment, a stop work order, or both until such time that the deficiency is resolved and approved by Engineer and Project Biologist.

In addition to normal progress inspections, the Contractor shall schedule and conduct the following formal inspections, giving notice to Engineer and Project Biologist a minimum of 7 days prior to readiness to conduct the following Site observations:

- a) Site observation of all revegetation Site areas after clearing and grubbing and prior to any excavation or plant material installations.
- b) Site observations immediately prior to seed application, planting, or both.

Site observation of the work shall not relieve the Contractor of the obligation to fulfill all conditions of the contract. Other observations, clearances, and monitoring activities are required in subsequent sections.

Upon completion of seeding and erosion control installations in vegetated areas, a punch list will be prepared by Project Biologist documenting any outstanding items to be completed or corrected. Contractor shall complete the punch list items within 10 days. Delay of completion of punch list items will delay the beginning of the specified PEP. Acceptance and written approval by the Engineer will establish the beginning of the PEP.

800-2.3 Earthwork and Topsoil Placement. For the purpose of this part, ADD the following to 308-2.1, "General:"

Finished soils in the upper 3' of all excavated areas in the vegetated area shall be predominately free of clay and sand. The Contractor shall not use subsurface soils from the deepest parts of the excavation unless specifically approved by the Engineer and Project Biologist.

The Contractor shall perform minor ground contouring (grading) at the direction of the Engineer in accordance with the Project Biologist's recommendations, and in accordance with the plans and specifications to establish the proper topography essential to the revegetation effort.

800-2.3.1 Topsoil Preparation and Conditioning Procedures. The salvaged topsoil shall be reapplied to the disturbed areas prior to planting and seeding. The topsoil shall be free of rocks and all clods of greater than 1". The Contractor shall match existing elevations of adjacent untouched native soils and shall provide natural drainage to the maximum extent possible. Compaction within revegetation areas will not exceed 75% standard proctor within the top 8" of soil. Compaction testing will be required, if deemed necessary by Engineer and Project Biologist, to verify specifications have been achieved. Overly compacted soils shall be de-compacted by ripping or tilling as directed by the Project Biologist.

800-2.3.4 Soils Testing. Soils in areas to be revegetated, including sub-soils and existing topsoil, shall be tested for soil fertility and agricultural suitability if directed by the Project Biologist.

The Contractor shall collect 1 composite soil sample from the specified revegetation area. Sample location shall be approved by Engineer and Project Biologist.

Tests shall be conducted and evaluated by a qualified soils scientist from an approved soils laboratory approved by Project Biologist and Engineer.

Soil analysis shall include measures of salinity (ppt), soil ph, soil percolation, sodium absorption ratio (SAR), and all water-soluble nutrients. In evaluating soil samples, soil analysis shall account for seasonal variation and shall make recommendations regarding soil amendments based upon the vegetation to be established in each area.

The Project Biologist shall evaluate the soils lab recommendations to determine if additional soil preparation requirements will be necessary prior to seeding.

The payment for soil testing shall be included in the Revegetation Maintenance and Monitoring Program lump sum Bid item.

800-2.3.5 Amending Site Soils. If soils analysis indicates soil amendments are necessary, specified amendment materials shall be evenly spread over designated planting areas and shall be thoroughly incorporated to a uniform soil depth of 6" by rototilling a minimum of 2 passes, the second pass perpendicular to the first pass. Soil amendment application rates shall be determined by Project Biologist and the approved laboratory following analysis.

800-2.3.6 Weed Eradication. The eradication of exotic plant species shall be required prior to any revegetation efforts. Herbicide shall be applied to weedy vegetation (e.g., giant reed (*Arundo donax*), tamarisk (*Tamarix* sp.), pampas grass (*Cortaderia jubata*), tree tobacco (*Nicotina glauca*), yellow star-thistle (*Centaurea melitensis*), cocklebur (*Xanthium* sp.), castor bean (*Ricinus communis*), annual beardgrass, and Bermuda grass (*Cynodon dactylon*), etc.) within the Site. All weedy species shall be cleared approximately 2 weeks following herbicide application unless authorized by the Project Biologist.

The Project Biologist shall be requested to review the weed species with the Revegetation Contractor prior to start of weeding. Revegetation shall not be allowed until weeds are removed from within the construction corridor indicated on the Plans. Volunteer species, as determined by the Project Biologist, may be left in-place to supplement the revegetation. Desirable native plants as identified by the Project Biologist shall not be removed.

The Project Biologist shall inspect the revegetation site prior to planting and during revegetation.

Manual weed eradication. If temperature and weather conditions permit, solarization shall be used to eradicate weeds and their seeds by applying white or black plastic sheeting over the weedy areas for approximately 2-3 weeks, as directed by the Project Biologist. Weed seedlings and sprouts shall be removed before attaining 12" in height and before producing seed.

No herbicides shall be used following the initial weed eradication unless authorized by the Project Biologist. Herbicides shall be limited to use on only the noxious species such as fennel, poison hemlock, bermuda grass, tamarisk, tree tobacco, pampas grass and giant reed and used only under the direct supervision of the Project Biologist. The herbicide shall be applied immediately after cutting of stems or branches. The Project Biologist shall monitor exotic species eradication.

All areas where weed removal creates bare areas in excess of 25 ft² shall be reseeded.

The Contractor shall possess demonstrated ability to identify the difference between desirable native species and invasive weeds.

Pulled weeds and debris shall be transported and disposed of properly off-site immediately to prevent any seed dispersal on the Site.

800-2.4 Finish Grading. For the purpose of this part, ADD the following to 308-2.4, "Finish Grading:"

Pre-existing grades and natural drainage courses shall be reestablished to their original grade and contour, in accordance with the direction of the Engineer and Project Biologist.

Final grading shall be acceptable to Engineer before planting operations will be allowed to commence.

The topsoil preparation and conditioning and preparation of the final grade shall be included in the lump sum bid item for Revegetation and Erosion Control.

800-2.5 Planting. For the purpose of this part, DELETE the first sentence in 308-4.1, "General" in its entirety and SUBSTITUTE with the following:

The Contractor shall replant unpaved portions of the pipeline alignment that are disturbed by the construction activity. The Contractor shall use only the types, sizes, and quantities of plant materials required by the plans and specifications, and permit conditions. The Contractor shall use quantities that will meet revegetation success criteria at the end of the specified PEP in accordance with 308-6, "MAINTENANCE AND PLANT ESTABLISHMENT."

Planting and seeding shall be performed after October 15 or before February 1 of any given calendar year. Seed installation outside of this time frame may take place when approved by the Project Biologist. Phasing of the installation will be acceptable based upon the progress of the construction, as approved by the Engineer and the Project Biologist. Specific planting times shall be limited to those periods when weather and soil conditions are suitable in accordance with locally accepted ecological, horticultural practice, or both as approved by the Engineer and the Project Biologist.

The Contractor shall be responsible for managing the Site and performing planting, maintenance, and corrective measures to promote healthy growth, establishment and success of the plantings. This shall include providing for drainage, irrigation, repair of damaged features, correction of deleterious conditions, maintaining a proper soil moisture level, weeding, fertilization, protection, temporary measures to promote establishment and other maintenance and construction efforts needed to provide for the successful establishment of the plant materials during the Contract Time.

The layout of locations for plants and outlines of areas to be seeded shall be approved on the Site by the Engineer and the Project Biologist. Container plant material and container plants shall be set by the Contractor in their final locations and approved by the Project Biologist prior to their planting.

800-2.6 Erosion Control Planting. For the purpose of this part, DELETE 308-4.91, "General" in its entirety and SUBSTITUTE with the following:

Erosion control planting shall be for slope protection and prevention of eroded sediments. Habitat restoration planting shall be for mitigation of habitats impacted by construction and shall attempt to create naturally appearing and functioning plant communities.

800-2.7 Seeding and Mulching. For the purpose of this part ADD the following to 308-4.9.3, "Seeding and Mulching":

Seeding shall be performed in accordance with 308-4.8, "Lawn Planting" and as follows.

Seeding shall be performed prior to application of any natural fiber matting, rice straw, etc. to ensure seeds' direct contact with the soil.

If seed application occurs between November and March, the seed shall be covered with natural fiber matting, rice straw, or another mulch cover, as directed by the Engineer or Project Biologist.

Seeding shall be started only after soil preparation and finish grading has been completed and accepted.

800-2.8 Hydro Seeding. Hydro seeding materials specified in the Special Provisions or as shown on the Plans shall conform to the following:

Type 11 Mulch (Bonded Fiber Matrix) Wood Fiber Mulch shall consist of:

- a) Wood fiber - Wood fiber shall be clean, natural non-recycled wood fiber processed to contain no germination or growth inhibiting factors, using nontoxic dye to facilitate metering of materials, manufactured in such a manner that after addition and agitation in slurry tanks with fertilizer, seed, water, and other approved additives, fibers in material will become uniformly suspended forming a homogeneous slurry that when hydraulically sprayed on ground, forms a blotter like ground cover impregnated uniformly with seed; which after application, will allow moisture, rainfall to percolate to underlying soil. Suppliers shall certify that their product meets all foregoing requirements based on testing.
- b) Stabilizing emulsion - Stabilizing emulsion shall be a concentrated liquid chemical that forms a film upon drying and allows water and air to penetrate. The films shall be non-flammable and shall have an effective life of at least 1 year. Stabilizing emulsion shall be nontoxic to plant or animal life and nonstaining to concrete or painted surfaces. In the cured state, the stabilizing emulsion shall not be re-emulsifiable. The material shall be registered with and licensed by the State Department of Food and Agriculture, as an "auxiliary soil chemical".

Hydroseeding shall be applied as follows:

- a) The Contractor shall coordinate with the Engineer to gain access to the Site, and to pre-arrange for the hydro seed slurry mixing.
- b) Spray all areas with a uniform, visible coat using the green color of the mulch as a guide. The slurry shall be applied in a sweeping motion, in an arched stream so as to fall like rain allowing the mulch fibers to build on each other until a good coat is achieved and the material is spread at the required rate per acre. The Contractor shall use care not to drag spray hoses over existing plant material and shall attempt to spray from the edges of the planting areas whenever possible.
- c) Slurry mixture which has not been applied to the planting areas within 4 hours after mixing will be rejected and shall be removed from the Site at the Contractor's expense.
- d) Slurry spilled into areas outside the limits of work shall be cleaned up at the Contractor's expense to the satisfaction of the Project Biologist and the Engineer.
- e) The Contractor shall coordinate with the Project Biologist to assure the Site is properly prepared prior to hydro seeding.
- f) The Contractor shall be responsible for repairing all ruts.
- g) Areas requiring grading, as determined by the Engineer, shall be repaired prior to hydro seeding. Where insufficient seed germination has occurred, the area shall be reseeded every 10 days until adequate germination has been confirmed by the Project Biologist.

800-2.9 Container Planting. Actual planting shall be performed during those periods when weather and soils conditions are suitable and in accordance with locally accepted horticultural practice, as approved by the Engineer or Project Biologist. No planting shall be done in any area until it has been satisfactorily prepared in accordance with these Specifications. The Contractor shall obtain approval from the Project Biologist of planting pit locations prior to planting. Plants shall be planted and watered as herein specified immediately after the removal from the containers. Containers shall not be cut prior to placing the plants in the planting area.

Planting shall not be performed if plant pits contain standing water, or if pits are over saturated to a condition which may result in an unhealthful condition for the plant. The Contractor shall provide a suitable growing condition for the plant material and to maintain that condition throughout the entire contract period.

Pits for container-grown plants shall be dug 2 times as deep and 3 times as wide as the container. Large clods shall be broken up and the sides of the pits should be scarified. The planting hole shall be filled with water. The water shall be allowed to percolate into the subsoil. Plants shall be thoroughly watered in their containers before planting. Native backfill material shall be placed into the bottom of the hole, moistened and tamped, and mounded slightly. Plants shall be centered in each pit in a vertical position so that the top of the root ball is set 1" above the finish grade. The pits shall be backfilled with soil thoroughly settled by water application. Two 21-gram plant tablets shall be added on opposite sides of the planting hole. An earthen berm shall be constructed around each plant. The reservoir berm for 1 gal plantings shall be a minimum of 12" in diameter and 2" in height. Thoroughly hand-water the basin. Allow to soak and repeat.

800-2.10 Erosion Control Matting. Construction corridors steeper than a 3:1 slope shall receive erosion control matting after grading and seeding have been completed.

800-2.11 Maintenance and Plant Establishment. Section 308-6, ADD the following:

After planting is completed, a field notification in writing will be issued to the Contractor to establish the effective beginning date of the PEP. The PEP shall be as specified in the Special Provisions and shall be extended by the Engineer if in the City's sole discretion:

- a) In addition to the PEP, additional planting is required to achieve the required performance standard e.g., 100% vegetative cover at the end of the Maintenance, and
- b) Monitoring Program described in this part, or other corrective work becomes necessary.

The Contractor shall notify the Engineer to schedule monthly inspections for the first 4 months to verify germination and establishment. After the first four months, and if the PEP is still in effect, inspections shall occur **in accordance with the Special Provisions**. The Contractor shall notify the Engineer of required inspections for the specified maintenance and monitoring period (e.g., 6 months, 12 months, 24 months (pre final), and 25 months (final).

The Contractor shall be responsible for immediately controlling any insect infestations and diseases that may spread throughout the revegetated areas. The use of pesticides shall require prior approval by the Engineer and Project Biologist.

The Contractor shall be responsible for the monitoring and control of herbivore activity within revegetated areas and shall inform the Project Biologist within 24 hours of discovery, who shall then prescribe remedial action. Remedial action, such as fencing and protective cages, shall be provided at the Contractor's expense.

Native vegetation and branch drop shall be retained in place unless removal is specially required. Removal of vegetation shall be pre-approved by the Project Biologist and the Engineer.

The Contractor shall remove and dispose off-site all non-organic debris. Removal of trash and litter shall continue on a regular basis during the PEP. Organic debris resulting from weed and exotic plant removal shall be removed from the site(s) and disposed of in accordance with 7-8, "WORK SITE MAINTENANCE."

The Contractor shall maintain silt and construction area fences on a continual basis throughout construction activity and the PEP.

The Contractor shall monitor for erosion within revegetation areas and shall prohibit gullies, rill and sheet erosion, bare soil areas and silt deposition from occurring. Erosion control shall emphasize prevention. Repair of eroded areas may include redirection of dissipation of the water source and re-contouring of soil followed by seeding, mulching, and planting as directed by Engineer.

The Contractor will be notified in writing that Work and the PEP have been accepted or that the PEP has been extended to correct any deficiencies remaining.

800-2.12 Revegetation Maintenance and Monitoring Program. When the PEP is completed to the satisfaction of the Engineer, a revegetation maintenance and monitoring program [Monitoring Program] shall commence in accordance with the Special Provisions. The Contractor shall perform the Monitoring Program in accordance with the terms of the Revegetation Maintenance and Monitoring Contract, included in the Contract Documents. The Engineer will issue a field notification to the Contractor to establish the commencement date of the Monitoring Program. The Contractor's obligation will be satisfied upon the commencement date of the Monitoring Program, and the NOC shall not be invalid by reason of the Contractor's obligations and work performed in accordance with the Revegetation Maintenance and Monitoring Contract.

800-2.13 Warranty and Replacements. Where seeded areas show signs of failure to grow at any time during the life of the contract and where seeded areas are so injured, damaged, dead or diseased as to render them unsuitable for the intended purpose, the Contractor shall reseed these areas within 30 days of receipt of written notice by Engineer at no additional cost to the City.

Seed species used for reseeding shall be the same species and quantity in accordance with the original seed list. Reseeding shall be furnished without cost to the City.

The Contractor's warranty period may be extended in cases where plants are slow to establish. If the Contractor fails to replace plants within the 30 day time limit, Engineer may replace them at Contractor's expense 5 Working Days after written notice to the Contractor.

The Contractor shall not be held responsible for failures due to vandalism and Acts of God during warranty period. Such conditions which exempt Contractor from the warranty shall be documented in writing by Contractor and delivered to Engineer within 1 month of occurrence.

800-2.15 Payment. The payment for items of Work described in Section 800, "REVEGETATION, MAINTENANCE, AND MONITORING" shall be included in the following Bid items as applicable unless specified otherwise in the Supplementary Special Provisions (SSP), Extended Revegetation Maintenance and Monitoring Contract, or both:

- a) Clearing and Grubbing: Payment for removal and disposal of the existing vegetation, trash, and other objects shall be included in the unit price Bid item for Clearing and Grubbing.
- b) Construction Fencing and Access Route: Payment for the construction of temporary facilities e.g., access routes and fencing shall be included in the unit price Bid item for Construction Fencing and Access Route.

- c) Revegetation and Erosion Control: Payment to complete planting, irrigation installation, erosion control and maintenance during the PEP for the landscape, irrigation and erosion control shall be included in the lump sum Bid item for Revegetation and Erosion Control.
- d) Monitoring and Reporting: Payment for Biological Monitoring and Reporting activities throughout the initial plantings and the PEP shall be included in the lump sum Bid item for Monitoring and Reporting.
- e) Revegetation Maintenance and Monitoring Program: Payment for the monitoring, reporting, and maintenance work required during the extended period beyond the PEP (PEP) and in accordance with the Revegetation Maintenance and Monitoring Contract including furnishing the required reports, site observations, and bond(s) shall be included in the lump sum Bid item for Revegetation Maintenance and Monitoring Program i.e., 25 months **unless otherwise noted**.

SECTION 801 – WATER POLLUTION CONTROL

801-1 DEFINITIONS AND ACRONYMS. For the purpose of Sections 801 and 7-8.6, the definitions and acronyms listed in Appendices 5 and 6 of the CGP shall apply except as follows:

Attachments – Attachments referenced in these specifications are from the CGP. Attachments can be viewed at the following website:

http://www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits.shtml

Best Management Practice (BMP) - (1) A method that is implemented to protect water quality and prevent or reduce the potential for pollution associated with storm water runoff and construction activities, e.g., scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices, (2) any program, process, siting criteria, technology, treatment requirement, or operating method, measure, or device that controls, prevents, removes, or reduces pollution.

Construction General Permit (CGP) – National Pollutant Discharge Elimination System CGP for the Storm Water Discharges associated with the construction and land disturbance activities i.e., State Water Resources Control Board Permit, Order No. 2009-0009 DWQ.

Discharger - The Contractor.

Legally Responsible Person (LRP) - The City of San Diego for the City's Public Works projects.

Linear Utility (Underground or Overhead) Project (LUP) - LUPs include any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid including water, wastewater for domestic municipal services, liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications e.g., telephone, telegraph, radio or television messages; and associated ancillary facilities.

Maximum Extent Practicable (MEP) - The technology-based standard established by the United States Congress in the Clean Water Act 402(p)(3)(B)(iii) that municipal discharges of urban runoff shall meet. MEP generally emphasizes pollution prevention and source control BMPs primarily as the first line of defense in combination with treatment methods serving as backup and additional lines of defense.

Municipal Permit - San Diego County Municipal Storm Water Permit, Order No. 2007-0001.

Numeric Effluent Limitation (NEL) - Any numeric or narrative restriction imposed on quantities, discharge rates, and concentrations of pollutants, which are discharged from point sources into waters of the United States, the waters of the contiguous zone, or the ocean. The CGP contains both narrative Effluent limitations and numeric Effluent limitations for pH and Turbidity.

Permit Registration Documents (PRD) - Includes a Notice of Intent (NOI), Risk Assessment, Site Map, Storm Water Pollution Prevention Plan (SWPPP), Annual Fee, and a signed Certification Statement.

Qualified Contact Person (QCP) - The trained and competent person employed by the Contractor responsible for the implementation of WPCP.

Storm Water Pollution Prevention Plan (SWPPP) - Site specific document required by the CGP and Municipal Permit.

Water Pollution Control Plan (WPCP) - A plan required by the City Storm Water Standards Manual for projects with less than 1 acre of ground disturbance, inclusive of any unpaved areas associated with the Project, which is determined to have a potential to impact water quality during construction.

WDID # - Waste Discharge Identification number required prior to the start of any construction activities for projects that disturb more than one acre or that are not eligible for a rainfall erosivity waiver.

Weather Triggered Action Plan (WTAP) - A written plan deployed with standby BMP's as needed to protect the exposed portions of the site within 24 hours of prediction of a storm event (a predicted storm event is defined as a forecasted, 40% or greater chance of rain) for WPCP purposes.

801-2 GENERAL. These specifications set the City's minimum requirements. The Contractor shall comply with the requirements of the Construction General Permit and Municipal Permit for any construction or demolition activity that results in a land disturbance.

The Contractor shall pay or reimburse the City for regulatory or court imposed fees, fines, or penalties imposed on the City arising from the Contractor's failure to complete the Work in compliance with the requirements of the CGP.

The Contractor shall be responsible for delays associated with the Contractor's failure to complete the Work in compliance with the requirements of the CGP.

801-2.1 Illegal Discharges. Any discharge to the City's Storm Water Conveyance System that is not composed entirely of Storm Water, or is prohibited by federal, state, or local laws, or degrades the quality of Receiving Waters in violation of any Plan Water Quality Objective shall not be allowed. The terms "Storm Water Conveyance System," "Storm Water," "Receiving Waters," and "Plan Water Quality Objective" shall be defined as set forth in San Diego Municipal Code § 43.0302, which is herein incorporated by reference into this contract.

801-2.2 Training. The contractor shall ensure that all persons responsible for compliance with the CGP shall be appropriately trained in accordance with the CGP. Training shall be both formal and informal, occur on an ongoing basis, and should include training offered by recognized governmental agencies or professional organizations. The Contractor shall provide documentation of all training to the Engineer and as required by the Annual Report.

801-2.3 Legally Responsible Person (LRP). For the purpose of SWPPP, the City has identified the LRP for the regulated Site and designated at least one AS in the event that the LRP is unavailable. Only LRP or the AS may certify the final submittal of the PRDs using the SMARTS.

801-2.4 Qualified SWPPP Developer (QSD). The Contractor shall appoint a QSD to complete the SWPPP with site specific BMPs and pertinent information in accordance with CGP prior to uploading onto SMARTS. The verification of the certification shall be submitted to the Engineer at the pre-construction meeting.

The QSD shall have the registration or certification, and appropriate experience, as required for in CGP, Section VII.B.1

Effective September 2nd, 2011, the QSD shall have attended a State Water Board-sponsored or approved QSD training course as directed by the CGP.

801-2.5 Qualified SWPPP Practitioner (QSP). The Contractor shall appoint a QSP. The QSP shall be responsible for non-storm water and storm water visual observations, sampling and analysis, preparation of the annual compliance evaluation, and the elimination of unauthorized discharges. The QSP shall be on-site daily to evaluate the conditions of the Site with respect to storm water pollution prevention.

- a) The QSP shall be either a QSD; or
- b) The QSP shall have one of the certifications and appropriate experience, as required for in CGP, Section VII.B.3.

Effective September 2nd, 2011, the QSP shall have attended a State Water Board-sponsored or approved QSP training course as directed by the CGP and shall be trained and certified to ensure full compliance with the CGP and implementation of all elements of the SWPPP.

801-2.6 Permit Registration Documents (PRDs). The Contractor shall prepare and upload the PRDs into the SMARTS. The PRDs will be reviewed, certified, and filed by the LRP or designee following the Contractor's submittal. The Contractor shall submit the PRD's to the Engineer for review at the pre-construction meeting in accordance with 2-5.3, "Submittals." The Contract Time shall start in accordance with 6-1.2, "Commencement of the Work" or as determined by the Engineer. The Work shall not commence without a valid WDID #.

- a) NOI Form – The Contractor shall complete and submit the NOI.
- b) Preliminary Assessment – For contracts subject to CGP, a preliminary assessment has been calculated for the design purposes based on the Site's characteristics and the CGP requirements. The QSD shall verify the City's assessment prior to submittal through SMARTS.

If the Site assessment is found to be at a higher level than the City's preliminary assessment, the additional Work required will be paid as Extra Work. If during the construction the level is increased resulting from the Contractor's failure to comply with the CGP, no additional payment will be made.

- c) Site Map - The Contractor shall submit the erosion control map(s) with the PRDs as described in the CGP.
- d) SWPPP - Using the City provided outlines; the SWPPP and each amendment shall be prepared and signed by the QSD. After the SWPPP is revised to the satisfaction of the Engineer, the SWPPP shall be uploaded through SMARTS.

The SWPPP shall be implemented and updated as necessary to address Site conditions. The Contractor shall make the SWPPP available at the Site during working hours while construction is occurring and shall be made available upon request by a State inspector or the Engineer.

- e) Permit Fee - The Contractor shall be responsible for paying the required permit fee to the State Water Resources Control Board immediately following the filing of the PRDs by the LRP.
- f) SWPPP - The SWPPP and each amendment shall be signed by the QSD. The Contractor shall submit the SWPPP using the City provided outlines and all other PRDs to the Engineer for review at the pre-construction meeting. The Contractor shall allow a minimum of 10 Working Days for review of each submittal by the City. If extensive additions or corrections are required, the Engineer will return the submittal for corrections and re-submission. After the SWPPP is revised to the satisfaction of the Engineer, the SWPPP shall be uploaded through SMARTS.

The Contractor shall prepare PRDs in accordance with Section 801, "WATER POLLUTION CONTROL," prior to the issuance of the NTP. The SWPPP shall be implemented and updated as necessary to address Site conditions. The Contractor shall make the SWPPP available at the Site during working hours while construction is occurring and shall be made available upon request by a State inspector or the Engineer.

801-2.7 Effluent Standards. Refer to CGP for the applicable effluent standards.

801-2.8 Record Retention. The Contractor shall refer to the CGP where applicable except that the required retention period shall be limited to the Contract Time.

801-2.9 Post-Construction Requirements. The Contractor shall comply with the post-construction requirements when post-construction requirements have been identified in the Contract Documents.

The Contractor shall mark every storm drain inlet within the projects boundaries with adhesive decal-discs or an imbedded concrete stamp. The Contractor shall use decal-discs on existing inlets and concrete stamps on new inlets. The concrete stamp is available from the Engineer with 5 days advance notice. On curb inlets, the concrete stamp or decal discs shall be placed on the top of curb at the inlet roof. On catch basins, the concrete stamp shall be imprinted next to the inlet grate.

For final site stabilization see 7-8, "WORK SITE MAINTENANCE." The QSP shall notify the Engineer if the removal of the construction BMP will expose the Site to conditions that would impair the water quality.

801-2.10 Notice of Termination (NOT). The Contractor shall terminate coverage of an LUP by uploading an electronic NOT onto SMARTS. By uploading an NOT, the Contractor shall be certifying that construction activities are complete and that the Project is in full compliance with requirements of the CGP. Upon approval by the appropriate Regional Water Board office, permit coverage will be terminated and communicated to LRP.

801-2.11 Risk Levels and LUP Types. The Contractor shall refer to the Risk Level or LUP Type identified for this contract and the following to determine the applicable requirements of the CGP:

801-2.11.1 Risk Levels.

- a) Risk Level 1 establishes the baseline requirements for all Risk Levels. See Attachment C.
- b) Risk Level 2 contracts shall be subject to Risk Level 1 requirements. See Attachment D.
- c) Risk Level 3 contracts shall be subject to Risk Level 1 and Risk Level 2 requirements. See Attachment E.

801-2.11.2 LUP Types. See Attachment A.

- a) Type 1 LUP SWPPP.

- b) Type 2 LUP contracts shall be subject to Type 1 LUP requirements.
- c) Type 3 LUP contracts shall be subject to Type 1 LUP and Type 2 LUP requirements.

801-3 RISK LEVEL 1. The requirements for Risks Level 1 are in Attachment C of the CGP.

801-3.1 SWPPP Requirements. The SWPPP shall address the following objectives:

- a) Control all pollutants and their sources associated with the Work.
- b) Identify and either eliminate, control, or treat all non-storm water discharges.
- c) Reduce or eliminate pollutants in storm water discharges and authorized non-storm water during and after construction through the implementation of appropriate BMPs.

The SWPPP shall include supporting information i.e., the conclusions, selections, use, and maintenance of BMPs.

A copy of the SWPPP and the BMP maps shall be kept at the Site and be made available to the Engineer or the State authorized inspector immediately upon request.

801-3.2 Construction BMP Requirements. BMPs shall be installed in accordance with California Stormwater Quality Association (CASQA) BMP handbooks (www.cabmp.handbooks.org).

801-3.2.1 Good Site Management "Housekeeping." The Contractor shall assess the potential pollutant sources, identify areas of the Site where additional BMPs are necessary, and assure of existing BMP effectiveness.

The Contractor shall control potential sources of water pollution before they come in contact with storm water systems or watercourses by implementing the measures specified in CGP for the following sources:

- a) Delivery, inventory, storage, stockpiling, and use of construction material;
- b) Construction waste e.g., concrete waste products, contaminated soil, hazardous materials, liquid waste products, solid waste products, sanitary or septic waste, and spills. A spill response and implementation plan shall be developed and included as a part of the SWPPP as an appendix or separate SWPPP chapter;
- c) On-site vehicle and equipment fueling, storage, and maintenance;
- d) Landscape materials e.g., fertilizers, mulches, and topsoil;
- e) Air depositions from the Work which include pollutants e.g., particulates as sediment, nutrients, trash, metals, bacteria, oil, grease, and organic matters.

801-3.2.2 Non-Storm Water Management. The Contractor shall identify all non-storm water discharges and either eliminate, control, or treat them. The Contractor shall wash vehicles and clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or drainage conveyance systems as specified in CGP.

801-3.3 Erosion Control. The Contractor shall control the Site erosion through the implementation of effective wind erosion control and effective soil cover for Inactive Areas, all finished slopes, open space, utility backfills, and completed lots.

The SWPPP shall include the sequencing of the Work activities and the implementation of effective Erosion Control BMPs while taking local climate e.g., rainfall and wind into consideration, thereby reducing the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking.

The SWPPP shall:

- a) describe when Work will be performed that could cause the discharge of pollutants in storm water;
- b) describe the water pollution control practices associated with each construction phase; and
- c) identify the soil stabilization and sediment control practices for all disturbed soil area.

801-3.4 Sediment Control. The Contractor shall control sources of sediment associated with the performance of the Work.

The Contractor shall establish and maintain effective perimeter controls, the stabilization of construction entrances and exits, and the protection of storm drain inlets with the potential to receive runoff from the Site.

The storm drain inlet protection shall not be removed until the Project is complete. The Contractor shall be responsible for preventing flooding associated with storm drain inlet protection. The water around the inlet shall not be allowed to pond if the standing water impedes the safe flow of traffic. Any BMPs temporarily removed by the Contractor to alleviate flooding shall be replaced or modified immediately as safety allows.

The storm drain inlet sediment control measures shall be of sufficient weight so as not to shift out of place or shall be secured in place against movement. Inlet sediment control measures shall be maintained daily or more often as needed. Maintaining inlet sediment control measures shall include replacing damaged BMPs, and removing and disposing of accumulated sediment, trash, and debris.

The Contractor shall design the sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook when sediment basins are used.

801-3.5 Run-on and Runoff Controls: Sites with lower risks of impacting water quality shall not be subject to the run-on and runoff control requirements unless an evaluation deems them necessary or visual inspections show that such controls are required. If required, the Contractor shall effectively manage run-on, runoff within the Site, and runoff that discharges off the Site. Run-on from offsite shall be directed away from disturbed areas or shall collectively be in compliance with the Effluent limitations in the CGP.

Calculations and design details as well as BMP controls for site run-on shall be included in the SWPPP.

801-3.6 BMP Inspection, Maintenance, and Repair. Inspection, maintenance, repair, and sampling activities on-site shall be performed or supervised by a QSP or appropriately trained designee.

- a) Inspections shall be performed weekly during dry weather and at least once each 24-hour period during extended storm events.
- b) Inspections and observations shall identify BMPs that need maintenance to operate effectively; have failed; or could fail to operate as intended.
- c) The Contractor shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.

801-3.7 Monitoring and Reporting. The Contractor shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) as required by CGP. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect

Project revisions. The CSMP shall be a part of the SWPPP, included as an appendix or separate SWPPP chapter. The CSMP shall address the objectives specified in CGP Attachment C, Section I.2.

The CSMP shall include monitoring procedures and instructions, location maps, forms, and checklists, which shall cover the following requirements:

- a) Visual Monitoring for Qualifying Rain Events.
- b) Visual Observation Exemptions.
- c) Monitoring Methods.
- d) Non-Storm Water Discharge Monitoring.
- e) Non-Visible Pollutant Monitoring.
- f) Particle Size Analysis for Project Risk Justification.

801-3.8 Annual Reports. If the Project is enrolled for more than one continuous three-month period, the Contractor shall electronically submit an Annual Report through SMARTS no later than September 1 of each year. The LRP will certify each Annual Report in accordance with the special provisions Section of the CGP (IV). Annual Reports shall be retained on-site while construction is ongoing.

The annual reports shall include the following:

- a) Storm water monitoring information as listed in Section XVI.D of the CGP; and
- b) Training information for all individuals responsible for Permit compliance (Section XVI.E).

801-4 RISK LEVEL 2. The requirements for Risks Levels are in Attachment D of the CGP.

801-4.1 Good Site Management "Housekeeping." The Contractor shall document Good Site Management measures in the SWPPP and REAP(s) for all phases of the construction.

801-4.2 Sediment and Erosion Control. In accordance with the CGP, the Contractor shall:

- a) Implement appropriate Sediment and Erosion Control BMPs for areas under active construction as defined in the CGP.
- b) Apply linear sediment controls.
- c) Ensure that construction activity traffic to and from the Project is limited to entrances and exits that employ effective controls to prevent offsite tracking of sediment.
- d) Ensure that storm drain inlets and perimeter controls, Runoff Control BMPs, and pollutant controls at entrances and exits (e.g. tire wash locations) are maintained and protected from activities that reduce their effectiveness.
- e) Inspect on a daily basis all immediate access roads daily.

801-4.3 Controls for Protecting Sensitive Receiving Waters. Sites that discharge to a sediment-sensitive water body shall include additional BMPs to protect against sediment laden-discharge. Refer to the CGP for additional information.

801-4.4 Rain Event Action Plan (REAP). A REAP shall be developed by QSD for all phases of construction. The Contractor shall ensure that a paper copy of each REAP is available on-site in compliance with the record retention requirements of the CGP.

The Contractor shall ensure that the QSP begins implementation of the REAP no later than 24 hours prior to the likely precipitation event.

801-4.5 Monitoring and Reporting Requirements. The CSMP shall be subject to the objectives specified in CGP, Attachment D, Section I.2.

The CSMP shall cover the following requirements:

- a) Visual Monitoring for Qualifying Rain Events.
- b) Water Quality Sampling and Analysis.
- c) Storm Water Discharge Water Quality Sampling Locations.
- d) Storm Water Sampling and Handling Instructions.
- e) Monitoring Methods.
- f) Analytical Methods.
- g) Non-Storm Water Discharge Monitoring.
- h) NAL Exceedance Report.

The Contractor shall electronically submit all storm event sampling results through SMARTS no later than 5 days after the conclusion of the storm event to be certified by the LRP.

801-5 RISK LEVEL 3. The requirements for Risks Level 3 are in Attachment E of CGP.

801-5.1 Monitoring and Reporting Requirements. The Contractor shall follow the following CSMP requirements:

- a) The CSMP shall address the objectives specified in CGP Attachment E, Section I.2.
- b) Water Quality Sampling and Analysis - The Contractor shall electronically submit all storm event sampling results to the State Water Board no later than 2 days after the conclusion of the storm event to be certified by the LRP.
- c) Receiving Water Monitoring Requirements.
- d) Receiving Water Sampling Locations.
- e) Analytical Methods.
- f) NEL Violation Report – The Contractor shall electronically submit all storm event sampling results through SMARTS no later than 2 days after the conclusion of the storm event to be certified by the LRP. Violation of NEL shall be reported via SMARTS within 24 hours after the exceedance.
- g) Bioassessment.

801-6 TYPE 1 LUP.

801-6.1 SWPPP Requirements. The SWPPP shall be designed in accordance with the objectives specified in Section K.1.

The QSD shall include information in the SWPPP that supports the conclusions, selections, use, and maintenance of BMPs.

The Contractor shall comply with the narrative Effluent standards listed in Section J.1.

A minimum of 3 LUP site maps shall be prepared as specified in B.2.

801-6.2 Construction BMP Requirements. The Contractor shall refer to Risk Level 1 requirements specified in Attachment C.

801-6.3 BMP Inspection, Maintenance and Repair. The Contractor shall at all times properly operate and maintain facilities and systems of treatment and control and related appurtenances in accordance with Section J.7 of Attachment A.

801-6.4 Monitoring and Reporting Program. The Contractor shall prepare a Monitoring and Reporting Program as required by Section M of Attachment A prior to the start of construction and shall immediately implement the program at the start of construction. The monitoring program shall be implemented at the appropriate level to protect water quality at all times throughout the life of the Project. The Monitoring and Reporting Program shall be a part of the SWPPP, included as an appendix, or separate SWPPP chapter.

The Monitoring and Reporting Program shall address the following:

- a) Visual inspection requirements i.e., storm event and daily site BMP inspections. QSP shall submit the inspection reports through SMARTS once every 3 rain events. The QSP's reporting through SMARTS shall not be subject to LRP certification.
- b) Monitoring Requirements for Non-Visible Pollutants.
- c) Visual Observation Exemptions.
- d) Particle Size Analysis for Project Risk Justification.

801-7 TYPE 2 LUP.

801-7.1 Sediment and Erosion Control. The Contractor shall follow the requirements listed for Risk Level 2 and these specifications. See 801-4.2, "Sediment and Erosion Control."

801-7.2 BMP Inspection, Maintenance and Repair. The Contractor shall follow the requirements listed for Risk Level 1 SWPPP. The Contractor shall ensure adequate laboratory controls and appropriate quality assurance procedures as specified in the CGP. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a Contractor when necessary to achieve compliance with the conditions of the CGP.

801-7.3 Monitoring and Reporting Requirements. The Contractor shall follow the following requirements from Section M.4:

- a) Inspection Requirements.
- b) Effluent Monitoring and Sampling.
- c) Monitoring Requirements for Non-Visible.
- d) Monitoring Methods.
- e) Analytical Methods.
- f) NAL Exceedance Report.

801-8 TYPE 3 LUP.

801-8.1 Construction BMP Requirements. See LUP type 2.

801-8.2 BMP Inspection, Maintenance, and Repair. The Contractor shall follow the requirements listed for Risk Level 1 SWPPP.

801-8.3 Monitoring and Reporting Requirements. The Contractor shall follow the requirements listed for LUP Type 1 and LUP Type 2 and the following:

- a) Storm Water Effluent Monitoring Requirements.
- b) Receiving Water Monitoring Requirements.

- c) RW Sampling Locations.
- d) Analytical Methods.
- e) NEL Violation Report - The Contractor shall electronically submit all storm event sampling results to the State Water Board no later than 2 days after the conclusion of the storm event to be certified by the LRP. In the event that the Contractor has violated an applicable NEL, NEL Violation Report shall be sent to the State Water Board via SMARTS within 24 hours after the NEL exceedance.

801-8.4 Payment. The payment for compliance with the requirements of CGP and these specifications shall be included in the various Bid items unless specific Bid items are provided in the Bid. Payment for the applicable permit will be made under the Allowance item provided in the Bid. Payment for the required trainings and certifications shall be included in the various Bid items.

The Contractor shall submit a Schedule of Values in accordance with 9-2.2.1, "Schedule of Values (SOV)." The SOV shall itemize the Work further as applicable to show more details as follows:

- a) Development and Amendment of PRDs
- b) Good Site Management "Housekeeping" BMPs
- c) Non-Storm Water Management
- d) Erosion Control
- e) Sediment Control
- f) Run-on and Runoff Management
- g) BMP Inspection, Maintenance, and Repair
- h) Development and Implementation of Construction Site Monitoring Program (CSMP)
- i) Annual Report
- j) Notice of Termination
- k) Development and Implementation of Sampling and Analysis Portion of CSMP
- l) Development and Implementation of Monitoring and Reporting Program
- m) Street Sweeping
- n) Development and Implementation of Rain Event Action Plan (for Risk Level SWPPPs)
- o) Development and Implementation of Active Treatment System (Risk 3 Only)
- p) Post Construction Requirements e.g., Inlet Markers (when specified)

For private projects, disregard references to measurement and payment and refer to the permit conditions for additional requirements.

801-9 Water Pollution Control Plan (WPCP). A WPCP shall be prepared for construction activity that results in land surface disturbances of less than one acre according to the guidelines of the City Storm Water Standards Manual or projects over one acre determined to be exempt from CGP.

The WPCP shall include erosion and Sediment Control BMPs, Good Housekeeping Measures, and site management.

The WPCP shall identify all construction BMP requirements listed in City Storm Water Standards Manual, Section IV, including routine monitoring and maintenance of the BMPs. The WPCP shall show the BMPs to be implemented during construction to reduce or eliminate discharges of pollutants to the storm drain conveyance system.

The WPCP shall be submitted to the Engineer at the pre-construction meeting. The WPCP shall be kept at the Site and made available to the Engineer at all times.

801-9.1 Site Management. The Contractor shall implement and update the WPCP when necessary, monitor the Site, and maintain BMPs in effective working condition.

The Contractor shall do the following:

- a) Designate a Qualified Contact Person (QCP) who shall be responsible for the development, implementation, maintenance, and improvement of the BMPs and WPCP. The QCP shall be trained and competent in the use of BMPs.
 - i. The QCP shall be on-site daily to evaluate the conditions of the Site with respect to storm water pollution prevention.
 - ii. The QCP shall be responsible for monitoring the weather and implementation of any emergency plans that shall be activated when there is a 40% or greater chance of rain. The weather shall be monitored with the National Weather on a 5-day forecast plan.
 - iii. The QCP shall be responsible for overseeing any site grading and construction operations, and for evaluating the effectiveness of the BMPs. The QCP shall ensure the modification of the BMPs as necessary to keep the Site in compliance and to ensure adequate routine maintenance of the BMPs.
- b) Educate all Subcontractors and employees about storm water pollution prevention measures required during construction activities to prevent the impact of construction discharges to the storm water conveyance system. Education requirements shall be in accordance with §F.2.J of the San Diego Regional Water Quality Control Board (SDRWQCB) Order No. 2001-1, dated February 21, 2001. The Contractor shall ensure that all personnel are trained in basic storm water construction management. A log of the trained staff and the educational materials shall be kept in the WPCP file and available to the Engineer at all times.
- c) Protect new and existing storm water conveyance systems from sedimentation, concrete rinse, or other construction related debris and discharges with the appropriate BMPs that are acceptable to the Engineer and as indicated in the WPCP.
- d) Indicate in the WPCP the locations of BMPs i.e., concrete wash out, vehicle maintenance, staging and storage area protection, etc. to be implemented. The Contractor shall ensure that these areas will be utilized properly and maintained regularly.
- e) Ensure that all waste and debris generated during the period of construction is contained within the storage and staging area or properly disposed. No sediment, oil, or contaminated run-off shall be allowed out of the storage and staging area. Perimeter and run-off control measures shall be installed around the storage and staging area. The entrance to the construction storage and staging area shall have stabilized entrances and roadways, metal pans to loosen dirt from tires, or the like, to reduce tracking and create a sediment barrier between the storage and staging area and the roadway.
- f) Inspect and document monthly or as directed by the Engineer the condition of all BMPs during the dry season, May 1 through September 30. Inspect and document weekly or as directed by the Engineer, the condition of all BMPs during the rainy season October 1 through April 30. The Contractor shall include documentation in the WPCP that BMPs were inspected at the intervals required and shall update and maintain this documentation for the duration of the Project.

- g) Conduct visual inspections daily and maintain all BMPs as needed. Visual Inspections and maintenance of all BMPs shall be conducted before, during and after every rain event and every 24 hours during any prolonged rain event. The Contractor shall maintain and repair all BMPs as soon as possible as safety allows.
- h) Return the land areas disturbed during construction to the pre-construction or equivalent protection, at the end of each workday to eliminate or minimize erosion and the possibility for discharge of sediment or other pollutants during a rain event.

If a non-storm water discharge leaves the Site, the Contractor shall immediately stop the activity and repair the damages. The Contractor shall immediately notify the Engineer of the discharge. As soon as practical, any and all waste material, sediment and debris from each non storm water discharge shall be removed from the storm drain conveyance system and properly disposed of by the Contractor at no cost to the City.

801-9.1.1 Construction Entrance and Exit Area

Temporary construction entrance and exit area shall be on level, stabilized ground. The entrance and exit area shall be constructed by overlaying the stabilized access area with 3 to 6" diameter stones. The area shall be minimum 50' long x 30' wide. In lieu of stone covered area, the Contractor may construct rumble racks of steel panels with ridges minimum 20' long x 30' wide capable of preventing the migration of construction materials into the traveled ways.

The payment for the construction, maintenance, and removal of entrance and exit area shall be included in the unit price Bid item for Construction Entrance and Exit Area.

801-9.2 Performance Standards. The Contractor shall be responsible for implementing water pollution control measures based on performance standards. Performance standards shall include:

- a) Non-storm water discharges from the Site shall not occur to the MEP. Storm water discharges shall be free of pollutants including sediment to the MEP.
- b) Erosion shall be controlled by acceptable BMPs to the MEP. If rills and gullies appear they shall be repaired and additional BMPs installed to prevent a reoccurrence of erosion.
- c) An Inactive Area shall be protected to prevent pollutant discharges. A Site or portions of a Site shall be considered inactive when construction activities have ceased for a period of 7 or more consecutive days.

BMPs shall be implemented and maintained at all times during construction. The Contractor is responsible for clean-up of debris, concrete waste, sweeping, and dust control. Construction debris and waste shall be contained and disposed of properly. Access locations shall be kept clean and swept daily or more often as needed to assure no sediment leaves the construction site. The surrounding public streets shall be kept clean and swept daily and as needed to keep sediment out of the storm drain conveyance system.

The Contractor shall implement BMPs in accordance with the California Storm Water Quality Association (CASQA) handbooks (www.cabmphandbooks.org) and in accordance with the California CGP for Construction Activities (www.swrcb.ca.gov). It is the Contractor's responsibility on both active and Inactive Areas to implement BMPs for all potential pollutant discharges.

801-9.3 BMP Requirements.

- a) Standby BMP materials necessary to protect the Site against erosion, to prevent sediment discharge, and to prevent non storm water discharges shall be stored on Site and readily accessible.

- b) The Contractor shall have an approved WTAP and have the ability to install standby BMPs to protect the Site to the MEP within 24 hours of prediction of a storm event defined as a forecasted, 40% or greater chance of rain. When required by the Engineer, the Contractor shall provide proof of this capability that is acceptable to the Engineer.

801-9.4 Payment. The payment for Water Pollution Control Plan and WTAP development and implementation shall be included in the various Bid items unless specific Bid items have been provided in the Bid.

The Contractor shall submit a Schedule of Values in accordance with 9-2.2.1, "Schedule of Values (SOV)." The SOV shall itemize the Work further to show more details as follows:

- a) Development and Amendment of WPCP
- b) Good Site Management "Housekeeping" BMPs
- c) Non-Storm Water Management
- d) Erosion Control
- e) Sediment Control
- f) BMP Inspection, Maintenance, and Repair
- g) Weather Triggered Action Plan
- h) Street Sweeping
- i) Post Construction Requirements e.g., Inlet Markers (when specified)

SECTION 802 – CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT

802-1 General. This subsection specifies construction and demolition waste reduction in compliance with Municipal Code §§66.0601–66.0610 (the City's Construction and Demolition Debris Diversion Deposit Program) and the City of San Diego's California Environmental Quality Act (CEQA) Significance Determination Thresholds. Pursuant to the City's Thresholds projects that result in the generation of less than 60 tons during the construction phase and 60 tons in the ongoing project use phase shall be considered to have no significant impacts. Adherence to the following specifications is intended to ensure compliance with both the City's Municipal Code and CEQA.

Additional information about the C&D Debris Diversion Deposit Program can be found online at: <http://www.sandiego.gov/environmental-services/recycling/cdrecycling.shtml>

During the construction phase of projects, the minimum waste management reduction goal is 90% of the inert material (a material not subject to decomposition such as concrete, asphalt, brick, rock, block, dirt, metal, glass, etc.) and 50% of the remaining project waste. The Contractor shall provide appropriate documentation, including a Waste Management Form (attached **as an Appendix** to SSP) and evidence of recycling and reuse of materials to meet the waste reduction goals specified in these specifications.

The Contractor shall comply with the City's Environmentally Preferred Purchasing Program (EP³), which can be found online at:

<http://www.sandiego.gov/environmental-services/recycling/cdrecycling.shtml>.

802-1.1 Submittals. The Contractor shall submit the following in accordance with 2-5.3, "Submittals":

- a) Waste Management Form showing a weight based "good faith" estimate of each type of construction waste that would be generated and specifying how construction waste will be

recycled. If space is limited or non-existing on-site for source separation, the Engineer will evaluate the diversion goals after a review of the Waste Management Form. The Contractor shall be responsible for implementation of the measures specified on the Waste Management Form Part 1 and meeting the waste reduction goals.

- b) Documentation from the recycling services that are not listed in the City Construction, Demolition, and Yard Waste Recycling Guide (available from City website) as follows:
 - i. Identifying where the construction and demolition material is taken.
 - ii. The method or process used to recycle the waste material.
 - iii. Identification of applicable state and local permits held by the recycling service provider and recycling facility.
 - iv. The City provided Waste Management Form at 50% progress payment and at completion of the Work.
- c) Waste Management Form. The Contractor shall submit the Waste Management Form Part 2 with each progress payment.

802-1.2 Waste Reduction Program.

802-1.2.1 Waste Diversion Strategy. The Contractor shall use one or a combination of the following waste management methods. Source separation of construction and demolition materials is required unless the Contractor can demonstrate that separation is not practical due to site size constraints, safety considerations, or both.

- a) Source separation. For construction and demolition projects, segregated temporary bins shall be provided for each type of material used on site, including packaging such as paper, cardboard, and metal. The bins shall be serviced on a weekly or as-needed basis, and the contents taken to an appropriate local processor.

The contractor shall identify and contact processors in the area that accept each type of building material before construction begins. If not re-used on site, salvaged materials shall be taken to the appropriate and proximal facility for recycling. Generating income through the sale of salvaged materials is permitted of the Contractor. Hand demolition shall be considered and chosen over mechanical demolition when it is considered to be cost-effective.

- b) Commingled or off-site separation. If source separation is not possible due to site or safety constraints, materials may be comingled for off-site separation.
- c) Time based separation. For phased construction projects, source separation of excess construction materials shall be required.
- d) Backhaul of inert materials and packaging to original source locations shall be done when trips can be minimized and materials diverted from disposal in this manner.
- e) On-site sales auctions and removal. Architectural items shall be removed and salvaged when practical. Windows, doors, mirrors, structural metal, or other specialty items will be donated or auctioned on-site or at a local urban center.

If not reused on site, excess cut and fill dirt shall be donated to another project or advertised as available via print ad, online, or any other suitable means.

802-1.2.2 Waste Management Hierarchy. Waste material management hierarchy shall be as follows:

- a) reuse on-site,
- b) recycle on-site,
- c) reuse off-site, and
- d) recycle off-site.

802-1.2.3 Alternative Approach. The Contractor may use any other innovative approaches as approved by the Engineer to meet and exceed the minimum diversion goals in accordance with the Municipal Codes §§66.0601–66.0610 and the City’s thresholds of significance for solid waste.

802-1.3 Disposal Site, Recyclers, and Waste Materials Processors. The Contractor shall use only facilities properly permitted by the State, County of San Diego, or local authorities where applicable. The Contractor shall notify the Miramar Landfill at least 24 hours in advance of bringing in 10 or more tons of waste in any one day, or 60 tons or more in any one month.

802-1.4 Construction and Demolition Waste Management Presentation. As part of the pre-construction meeting, the Contractor shall review and present the Waste Management Form. The Contractor shall discuss and coordinate procedures, schedules and specific requirements for waste materials recycling and disposal. The Contractor shall identify potential compliance problems and matters requiring further resolution. Construction and demolition waste management shall be agenda item at all future construction meetings. The Contractor shall make the agreed upon revisions to the proposed Waste Management Form subsequent to the meeting and submit the revised plan to Engineer for acceptance.

802-1.5 Special Project Conditions. For certain types of projects, the Contractor shall implement the following special procedures:

- a) Sediment and debris removal. When removal of sediments and debris from channels and storm drains are required, the Contractor shall make a preliminary estimate of the materials that can be diverted to beneficial use. Receipts from disposal, re-use, and recycling options shall indicate that 50% of materials are diverted.

These uses include:

- i. Recycling
 - ii. Composting
 - iii. Use as a fill material
 - iv. Alternative daily cover
 - v. Land application
 - vi. Cement, brick, block, or asphalt constituent
 - vii. Road bed
 - viii. Beach replenishment
 - ix. Other non-disposal use
- b) Old landfill and contamination site cleanup. Projects involving landfill and contamination site cleanups shall be exempt from diversion requirements **unless specified otherwise in the Special Provisions.**

802-1.6 Implementation. The Contractor shall do the following:

- a) Designate an on-site party responsible for instructing workers and implementing the Waste Management Form.

- b) Distribute copies of Waste Management Form to Site supervisor and each Subcontractor.
- c) Include waste management and recycling in worker orientation.
- d) Provide on-site instruction on appropriate separation, handling, recycling, and recovery methods to be used by all parties at the appropriate stages of the Work at the Site.
- e) Include discussion of waste management and recycling in regular job meetings and job safety meetings conducted during the course of Work at the Site.
- f) Remove and relocate reusable materials to be reinstalled or retained in a manner to prevent damage or contamination.
- g) Conduct construction and demolition in such a manner to minimize damage to trees, plants and natural landscape environment.
- h) Arrange for adequate collection, transportation, and delivery of the recovered materials to the approved recycling center or processing facility.
- i) Maintain records accessible to the Engineer for verification of the diversion of the recovered waste materials.

802-1.7 Storage and Handling. The Contractor shall do the following:

- a) Provide separate containers for different types of materials (if Site conditions warrant).
- b) Label each container with signs, instructions, and a list of all acceptable materials. The information shall be in English and Spanish with recycling signs and stickers and graphic symbols commonly used by the construction industry, including National Fire Protection Association labels, and recycling signs and stickers.
- c) Remove all materials for recycling and recovery from the work locations to approved containers. Failure to remove waste or recovered materials may be considered cause for withholding payment.
- d) Place containers for recyclable and recoverable materials at designated location on the Site. If materials are sorted on Site, the Contractor shall provide a sorting area and necessary storage containers.
- e) Change loaded containers for empty containers, as demand requires.
- f) Provide adequate security from pilferage if recovered materials are stored on-site for Project duration.
- g) Deposit indicated recyclable and recoverable materials in storage areas or containers in a clean (no mud, adhesive, solvents, petroleum contamination), debris-free condition. The Contractor shall not deposit contaminated materials into the containers unless the materials have been cleaned.
- h) Ensure all recovered materials are safe for handling and storage.
- i) Prevent any chemical contamination of recyclable material. If recyclable material becomes contaminated, the Contractor shall report the incident to the Engineer. The Contractor shall not deposit the material into the recycling containers. Contaminated materials shall be handled in accordance with Section 803 "Encountering or Releasing Hazardous Substances" and Section 804 "Encountering Contaminated Soil."

802-1.8 Payment. Payment for construction and demolition waste management shall be included in the following Bid items:

- a) Preparation of Waste Management Form (LS)
- b) Site Storage and Handling of construction and demolition Waste (Ton)
- c) Disposal of construction and demolition Waste (Ton)

The payment shall be included in various Bid items if no Bid item(s) have been provided for construction and demolition waste management. Final payment will be withheld until such time as

the Contractor adequately demonstrates the final disposition; either diverted or disposed, of materials generated by the Project. Final status report is required before the Final payment.

SECTION 803 – ENCOUNTERING OR RELEASING HAZARDOUS SUBSTANCES OR PETROLEUM PRODUCTS

803-1 GENERAL. If the Contractor encounters, causes the release of, or has knowledge of a release or an imminent release of Hazardous Substances or petroleum products, construction activities in the area shall immediately cease except in an emergency.

A waste determination shall be performed on all potential Hazardous Waste or Regulated Waste generated at a Site within 10 days of generation to determine if it meets Hazardous Waste or Regulated Waste criteria in accordance with 22 CCR Division 4.5, 23 CCR Division 3, or any other pertinent law or regulation which could restrict the disposal of the waste to a municipal landfill, sewer discharge, or storm drain discharge. The results of all waste determinations shall be submitted to the City for concurrence prior to any disposal or discharge of the waste in question.

Incomplete or inconclusive waste determinations conducted by the Contractor, as determined by the City, will be returned to the Contractor for additional information or testing. The City's approval of the final determination of the waste and the disposal or discharge location shall be required.

Substances requiring analytical testing shall be sampled and tested in accordance with the sampling and analytical testing requirements in these specifications.

If there is a health and safety plan for this specific site or Project, it shall be fully complied with.

The Contractor shall follow and comply with all applicable Federal, State, and local laws and regulations and notification requirements.

The Contractor shall not resume work in any such affected area until after the Contractor has determined that such condition and any affected area has been rendered safe for the resumption of Work, or specifying any special conditions under which Work may be resumed safely.

The business entities proposed for use by the Contractor related to hazardous substance or petroleum product management shall be in good regulatory standing and have not received regulatory fines more than \$25,000 in total in the past 3 years. These entities include:

- a) The licensed Hazardous Waste Transporter.
- b) The Petroleum Contaminated Soil Disposal and Recycling facility.
- c) The TSDF.
- d) Handling Facility.

If the Contractor encounters unforeseen Hazardous Substances or petroleum products, the Contractor shall immediately notify the Engineer and County of San Diego, Department of Environmental Health (DEH) at (619) 338-2222. If there is an immediate fire, explosion, or health or safety threat, the Contractor shall notify the Fire Department via 911.

803-2 CITY RESPONSIBILITY. The City will be responsible for any Hazardous Substances and Hazardous Waste as defined by §§ 25316 and 25117 of the California Health and Safety Code, uncovered or revealed at the Site which existed prior to the date of the NTP and was not identified in the Contract Documents to be within the scope of the Work. The City shall not be responsible for any such materials brought to the Site after the NTP.

803-3 DEFINITIONS. For the purpose of these specifications the following definitions apply:

Burn Ash - The residual ash that results from the low temperature combustion of solid waste. Burn ash is generally found at a location where solid waste has been burned and the resulting debris have been buried or stockpiled.

Chemical Release- any Spilling, leaking, pumping, pouring, emitting, emptying, discharging, dumping, injecting, escaping, leaching, or disposing into the environment as defined by HSC 25501 (s), 19 CCR, 40 CFR 302, and any other applicable regulatory definition.

Closed Container - a container is closed when the lid, ring, gaskets, and bung are latched, screwed, and tightened in such a way that the contents, including vapors, are confined within the space of the container.

Empty Hazardous Materials Containers – a container which previously held a Hazardous Material is considered empty when: i) the container, when it is held in any orientation (e.g., inverted, tilted, etc.) and no liquid drains from the container, ii) all of the solids have been removed by a physical method so that no more than a thin uniform film remains in the container. Empty Hazardous Material containers are Hazardous Waste unless managed in accordance with 22 CCR 66261.7.

Handling Facility – A facility that is not licensed as a TSDF and has been permitted in California to legally accept a Hazardous Material or recyclable waste for reuse, recycling, or other legal handling method. This excludes facilities accepting petroleum contaminated soils. See Petroleum Contaminated Soil Disposal and Recycling Facility definition below.

Hazardous Material - a material which may cause harm to humans, animals, or the environment as defined by HSC 25501 (o) and implemented in HSC Chapter 6.5 and 22 CCR.

Hazardous Substance - a Hazardous Material, hazardous waste, petroleum products, or any chemical product which a manufacturer or producer is required to prepare an MSDS or as defined by HSC 25501(p) and 25281 (h).

Hazardous Waste - A Hazardous Material that can no longer be used for its intended purpose as defined in HSC 25115, HSC 25117, and HSC 25316 and implemented in HSC Chapter 6.5 and 22 CCR and 40 CFR Part 260 - 299

Hazardous Waste Determination - The process which shall be used to determine if a waste is hazardous or non-hazardous as required in 22 CCR and testing methods in SW-846.

Hazardous Waste Manifest - the state and federal approved shipping document required by law to track the transportation and disposal of hazardous waste. The document is originated and signed by the generator of the waste in accordance with 22 CCR.

Licensed Hazardous Waste Transporter – A transportation company which holds all of the following valid permits, identification numbers, licenses, and registrations:

1. California Department of Toxic Substances Control permit
2. California Department of Motor Vehicles – Motor Carrier Permit
3. U. S. Environmental Protection Agency – Identification number
4. U. S. Department of Transportation – Identification number
5. U. S. Department of Transportation – Hazardous Materials Certificate of Registration
6. California Highway Patrol – License

MSDS - Material Safety Data Sheet

Non-RCRA Hazardous Waste – A waste that is defined and regulated as Hazardous Waste only within the State of California and defined in California regulation 22 CCR Division 4.5, Chapter 11, Article 3.

Petroleum Contaminated Soil Disposal and Recycling Facility – A recycling or disposal facility which has as a minimum a valid California regional water quality control board permit including Waste Discharge Requirements (DWRs) and air emission permit to receive specific petroleum contaminated soils for processing, bioremediation, recycling, alternative fuel, or disposal. If a facility is chosen that is located outside of California, it shall be equally permitted and regulated by the state in which the TSDf resides.

RCRA Hazardous Waste – A waste which is managed as Hazardous Waste within and outside the State of California and is defined in Federal regulation 40 CFR Part 261 and California regulation 22 CCR Division 4.5, Chapter 11, Article 4.

Regulated Waste - A waste, that is not considered Hazardous Waste, but due to its chemical or physical properties, petroleum contamination, or other properties, it must be disposed of to a facility with Regional Water Quality Control Board approved Waste Discharge Requirements (WDRs), such as a municipal Class III landfill or other facility with WDRs that allow disposal of the Regulated Waste.

Spill - Refer to the definition of Release and Threatened Release

Threatened Release – a condition creating a substantial probability of harm, when the probability and potential extent of harm make it reasonably necessary to take immediate action to prevent, reduce, or mitigate damages to persons, property, or the environment.

TEEM - Tank Engineering and Environmental Management

TSDf - a Hazardous Waste transfer, treatment, storage, or disposal facility which has received a California Department of Toxic Substances Control permit, a grant of interim status, or a variance or is otherwise authorized by California law and regulations to receive specific RCRA and/or Non-RCRA hazardous wastes for processing, recycling, alternative fuel, or disposal. The TSDf is regulated by other California regulatory agencies for storm water compliance, air emissions, and fire codes, as applicable. If a TSDf is chosen that is located outside of California, the TSDf shall be equally permitted and regulated by the state in which the TSDf resides.

Universal Waste - An item, substance, or object which must be stored, handled, and disposed of as defined by CCR Title 22, Chapter 23, §§ 66273.1-66273.90.

803-4 HAZARDOUS SUBSTANCES MANAGEMENT PLAN. For general management of Hazardous Materials, hazardous wastes, petroleum contaminated soil, and Regulated Wastes at the Site, the Contractor shall submit a Hazardous Substances Management Plan in accordance with 2-5.3, “Submittals” subject to the following regulations prior to start of the Work:

- a) 49 Code of Federal Regulations (49 CFR)
- b) 40 Code of Federal Regulations (40 CFR)
- c) California Code of Regulations, Title 22 (22 CCR)
- d) California Code of Regulations, Title 19 (19 CCR)
- e) California Health and Safety Code, Chapter 6.5 (HSC)
- f) Uniform Fire Code (UFC)

The Contractor’s submittal shall include:

- a) A description on how the Contractor will store, manage, and inspect all Hazardous Materials brought to the Site including the management of all containers, drums, and tanks.
- b) A listing of all hazardous wastes, petroleum contaminated soils, and Regulated Wastes anticipated to be generated or encountered during the course of the Project and the name of

the trained Hazardous Waste contractor(s) who will perform the removal, storage, transportation, and disposal activities for each waste type listed.

When disposing of the Non-RCRA Hazardous Waste, Petroleum Contaminated Soil, and Regulated Waste outside the State of California or to Indian Country or Indian tribal lands, the Contractor shall utilize facilities as defined in these specifications.

The following information for each RCRA hazardous waste, Non-RCRA hazardous waste, petroleum contamination soil, and Regulated Waste that is expected to be encountered during the construction:

- a) Name of the RCRA hazardous waste, Non-RCRA hazardous waste, petroleum contaminated soil, or Regulated Waste.
- b) Disposal Method i.e., recycling, alternative fuel, bioremediation, thermal desorption incineration, treatment, Class I, II or III Landfill.
- c) Name of Licensed Hazardous Waste Transporter(s).
- d) Name of Treatment, Storage, and Disposal Facility (TSDF), Petroleum Contaminated Soil Disposal/Recycling Facility, or Handling Facility where the waste will be treated, recycled and/or disposed. Include the name(s) of each any interim facilities where the hazardous waste, petroleum contaminated soil, and/or Regulated Waste will be stored, handled, or treated prior to shipping to the final destination facility.

Hazardous Waste Hazardous Waste Example: Hazardous Waste, Petroleum Contaminated Soil, and Regulated Waste Disposal Information Submittal.

Waste Stream	Disposal Method	Transporter 1	Transporter 2	Facility	Facility
HazWaste #1	Treatment	ABC Haz Waste Transporter	None	Acme Neutralization	None
Regulated Waste #1	Recycle	XYZ Transporter	HazMat Hauler	Smith Recyclers	None
HazWaste #2	Incinerate	ABC Haz Waste Transporter	HazWaste Transporter	ABC Transfer Station	Acme Incineration
Petroleum Contaminated Soil	Thermal Desorption	XYZ Transporter	None	XYZ soil recyclers	

- e) For each Hazardous Waste transporter and facility listed, include the name, address, phone number, company contact and list all registrations, permits, licenses, and identification numbers as specified in these specifications.
- f) Laboratory testing, if required, provide the following:
 - i. Name, address, phone number, company contact, and certification number for each certified Hazardous Waste testing laboratory used.
 - ii. A list of the tests each laboratory is certified to perform under the laboratory's State certification.

After start of the Work, the following submittals shall be made by the Contractor:

- a) Hazardous Waste Storage Logs submitted weekly.
- b) Periodically During Work: Chemical Release Spill Report Forms when as necessary.

- c) Hazardous Waste Disposal and Laboratory Testing when as needed.
- d) Draft Hazardous Waste Manifests for approval submitted prior to scheduling disposal.
- e) Two legible copies of each Hazardous Waste Manifest used submitted immediately after receipt from transporter.
- f) Copies of all other disposal receipts and documentation i.e., Bills of Lading submitted immediately after receipt from transporter.
- g) Copies of analytical test data submitted within 1 day of receipt from laboratory.
- h) Approved waste profiles submitted prior scheduling to disposal.

803-5 EMPLOYEE TRAINING. The Contractor's employees and Subcontractors who manage Hazardous Waste shall be trained to ensure compliance with all regulations. The Contractor's employees and Subcontractors working at the Site shall be able to respond effectively to emergency situations including chemical releases (22 CCR 66265.16).

803-6 SAMPLING AND ANALYTICAL TESTING REQUIREMENTS. A suspect item or waste that may be hazardous or contain a hazardous or regulated component or petroleum contamination shall be separated from other waste for the City's determination if a Waste Characterization is needed or if the suspect item or waste, or petroleum contamination had been identified in the contract.

Each testing method shall be approved by the City as appropriate for the sample being tested prior to having a certified laboratory conduct the test.

Representative samples shall be obtained by the Contractor for each waste to be tested with the sampling procedure pre-approved by the City. The City shall be contacted prior to sampling and be present to observe the sampling. Items sampled without the presence or approval of the City may require the item or waste to be re-sampled.

Containers e.g., jars, bags, etc. used for sampling shall be certified by a State licensed Hazardous Waste Laboratory as "pre-cleaned." Samples shall be sent to a State licensed Hazardous Waste Laboratory for testing. The Laboratory shall have a valid State license for each requested test to be conducted on the sample. The sample testing time and preliminary results shall be available on the 5th Working Day or other agreed upon date after the sample was taken.

A final copy of all analytical test results and the sampling chain-of-custody form shall be provided to the City within 1 Working Day of receipt from the State Hazardous Waste certified testing laboratory.

803-7 HAZARDOUS MATERIALS AND WASTES STORAGE AND MANAGEMENT.

- a) Hazardous substances, hazardous wastes, or items, and equipment containing Hazardous Substances or hazardous wastes shall be handled in such a way as to minimize the possibility of a release.
- b) Hazardous substances shall always be kept in an approved, compatible, and Closed Container with a legible label identifying the contents. No interim containers including such as bags, transfer containers, buckets, or pails shall be acceptable.
- c) Containers used to package Hazardous Waste shall be compatible with the waste (22 CCR 66265.172), maintained in good condition (22 CCR 66265.171), and kept closed unless adding or removing waste (22 CCR 66265.173).
- d) Different waste types shall be stored in separate containers and incompatible wastes shall never be combined or stored near each other.

- e) Any packaging used to store and or transport Hazardous Waste off-site such as a container, roll-off bin, tank or other device, shall comply with 49 CFR Parts 173, 178, 179 and be labeled and prepared for transportation in accordance with 22 CCR Article 3.
- f) A Hazardous Waste label shall be affixed to the container and filled out when the first amount of Hazardous Waste or Hazardous Substance is placed in the container. The label shall include the generator information, contents of the container, physical state and hazardous properties of the waste, and the initial accumulation date. The Contract appendices contain a sample Hazardous Waste label.
- g) The Contractor shall use a numbering system to identify each Hazardous Waste container. Each Hazardous Waste container shall be marked with an identification number specific to that individual container.
- h) Additional pre-transportation labeling and marking or using placards shall be conducted prior to transporting Hazardous Waste off-site and in accordance with 22 CCR Chapter 12, Article 3 and 49 CFR.
- i) Containers, containment systems, and tanks of Hazardous Materials and Hazardous Waste shall be managed in a way which minimizes the threat of fire, explosion, or any unplanned sudden or non-sudden release of Hazardous Waste to the air, soil, or surface water which could threaten human health or the environment (22 CCR 66265.31).
- j) Secondary containment shall be provided at a minimum for storage areas containing 55 gallons or more of Hazardous Material or hazardous waste. The secondary containment area shall be capable of holding the contents of the largest container plus 10% of that volume or in accordance with applicable regulations (22 CCR 66264.175).
- k) Secondary containment areas shall be maintained so any releases will be confined within the secondary containment area. Rips, tears, cracks, breaks, etc. that compromise the integrity of the secondary containment shall be immediately repaired.
- l) Secondary containment systems shall be maintained free of dirt, debris or liquids. If any chemical is released into the secondary containment system, it shall be removed immediately.
- m) Material used in or around the secondary containment area which has been contaminated with a Hazardous Material or Hazardous Waste shall not be disposed until a Hazardous Waste Hazardous Waste Determination has been performed in accordance with these specifications. Contaminated materials include, but are not limited to, plastic sheeting, absorbents, dirt, sand, and kitty litter. Contaminated materials found in or around containment areas shall be immediately cleaned-up.
- n) When conducting a waste determination on soil, procedures and protocol specified in the Site Assessment and Mitigation Manual (SAM Manual) shall be followed.
- o) The Contractor shall perform weekly inspections of their Hazardous Material and Hazardous Waste storage areas to comply with the regulations (22 CCR 66265.174). An inventory of Hazardous Waste containers will be kept noting each waste container and its accumulation start date. Inspections shall be documented and copies provided to the City upon request.

803-8 HAZARDOUS WASTE, REGULATED WASTE, PETROLEUM CONTAMINATED SOIL ACCUMULATION TIME. Each container or pile of Hazardous Waste shall be shipped off-site for disposal by a licensed Hazardous Waste transporter within 90 days of the date of initial generation or

by the end of the Project, whichever comes first. Regulated Wastes and petroleum contaminated soils shall be shipped off-site for proper recycling or disposal within 90 days of the initial generation or by the end of the project, whichever comes first.

803-9 HAZARDOUS WASTE TRANSPORTATION REQUIREMENTS. The City will provide the Contractor with the EPA Generator Identification number for the Site. This number is site specific and shall only be used on Hazardous Waste disposal documentation for the appropriate site where the waste was generated.

A Hazardous Waste Hazardous Waste Manifest or, when appropriate, a bill of lading, non-Hazardous Waste Hazardous Waste Manifest or other appropriate disposal documentation shall be completed in accordance with 22 CCR Chapter 12, Article 2 and 49 CFR for any shipment of Hazardous Waste leaving the Site.

The Engineer or other designated City representative will sign the Hazardous Waste Hazardous Waste Manifest or disposal documentation as representing the Hazardous Waste generator at the time the Hazardous Waste is being removed from the Site. Pre-signed Hazardous Waste Hazardous Waste Manifests or bills of lading are not acceptable.

The Contractor shall only ship Hazardous Waste using a City pre-approved Hazardous Waste Licensed Hazardous Waste Transporter with valid insurance certificates in accordance with 7-3, "Liability Insurance." The Hazardous Waste shall be sent only to a treatment, storage, and disposal facility (TSDF) that is approved by the City in the Hazardous Materials Submittal in accordance with 22 CCR Chapter 13. Any contractor who allows the transportation or disposal of Hazardous Waste from a City site by an Hazardous Waste unlicensed Hazardous Waste Transporter, upon conviction, shall be subject to 1 year in prison and fined up to \$100,000 per day (HSC 25163, 25189.5).

803-10 MANAGEMENT OF SPECIFIED WASTES. The Hazardous Material that is removed from Empty Hazardous Materials Containers shall be used as Hazardous Material or disposed of as a hazardous waste. The Contractor shall mark each container with the date it was emptied and manage the container within one year by one of the following methods:

- a) Reclaim the scrap value of the container;
- b) Send the container off-site for reconditioning or remanufacturing;
- c) Send the container back to the manufacturer; or
- d) Dispose of as hazardous waste.

For containers 5 gallons capacity or less, once the container is empty, it may be disposed of to the regular trash.

Aerosol spray containers may be disposed of in the regular trash if the contents and propellant have been emptied to the maximum extent practical under normal use (i.e., the spray mechanism was not defective and thus allowed complete discharge of the contents and propellant). Aerosol spray containers shall not be punctured, crushed or altered in order to remove or release any remaining contents or propellant for the purpose of emptying the container for disposal to the trash.

A compressed gas cylinder is empty when the pressure in the container approaches atmospheric pressure.

803-11 REGULATORY REPORTING FOR CHEMICAL RELEASE OR THREATENED RELEASE. Chemical releases or threatened releases involving a gas, liquid or solid Hazardous Materials or Hazardous Waste shall be immediately assessed utilizing the County Department of Environmental Health's

Assessment form as a guide to determine if the incident requires regulatory reporting to the Cal EMA, County Department of Environmental Health, Hazardous Materials Division, the National Response Center and any other pertinent regulatory agency. See the Contract appendices for a copy of County Department of Environmental Health's Assessment form.

Lack of immediate reporting a chemical release or Threatened Release shall be subject to fines and penalties by the County of San Diego and any other pertinent regulatory agency.

Chemical releases or threatened releases involving a gas, liquid or solid Hazardous Materials or Hazardous Waste shall be immediately reported to the City after completing all regulatory reporting.

Chemical releases and any contaminated media (rags, absorbents, soil, etc.) shall be immediately contained, cleaned up, and handled as Hazardous Waste at the Contractor's expense. The waste shall be handled as Hazardous Waste unless a complete Hazardous Waste Hazardous Waste Determination, as approved by the City, is performed indicating the waste to be non-hazardous.

A Chemical Release Report Form or similar document shall be completed and faxed to the City at the designated number within 4 hours of the occurrence of the chemical release for all incidents of Hazardous Materials or hazardous wastes in quantities equal to or exceeding 5 gallons in quantity or for any size release that required regulatory reporting as determined by the County Department of Environmental Health's Assessment form. The Contract appendices contain a blank Chemical Release Report Form.

803-12 ENCOUNTERING CONTAMINATED SOIL. Contaminated soils have specific soil contaminants which cause the soil to be defined as a RCRA Hazardous Waste, Non-RCRA Hazardous Waste, Petroleum Contaminated Soil, or Regulated Waste.

When encountering petroleum contaminated soil, abandoned underground storage tanks, petroleum transmission pipelines, Burn Ash, or unidentified contamination, the Contractor shall follow the guidelines of the current edition of the County of San Diego, Department of Environmental health (DEH) Site Assessment and Mitigation Manual (SAM Manual), which is available by contacting the DEH at (619) 338-2222.

If the Contractor encounters unforeseen contaminated soil, the Contractor shall immediately notify the Engineer when apparent contaminated soils are encountered. Following notice by the Contractor, the Engineer will contact the City's Environmental Services Department, Office of Environmental Protection and Sustainability, TEEM Program at (858) 627-3311.

803-13 Monitoring of Potentially Petroleum Contaminated Soil. Monitoring for the presence of petroleum contamination shall be the Contractor's responsibility and shall be performed in areas of known or suspected contamination during construction activities. The Contractor shall notify the Engineer 5 days prior to excavation in areas of known contamination, and immediately if suspected or unforeseen contamination is encountered.

An operational Explosimeter (Combustible Gas Indicator - CGI), calibrated for and capable of automatically detecting explosive gases at 20% of the Lower Explosive Limit (LEL) shall be used by the Contractor. The functional requirements of the CGI shall comply with the Site Assessment and Mitigation (SAM) Manual. If 20% or greater of the Lower Explosive Limit (LEL) is detected in an excavation, surface area or confined space, the Fire Department and the DEH shall be notified immediately. In areas of known or suspected contamination, an operational Photo Ionization Device (PID) shall also be used by the Contractor. Any soil that triggers a PID detection shall be segregated and stockpiled for further characterization.

The Contractor will not be reimbursed for costs associated with monitoring activities as the City considers these efforts to be integral and essential to best management health and safety practices for trenching and excavation operations.

803-14 Stockpiling Contaminated Soil. Unless directed otherwise by the Engineer, the Contractor shall stockpile all suspect contaminated soil (as indicated by appearance, odor, or PID detection) at a location approved by the Engineer and the TEEM Program and in accordance to the following procedure. Stockpiled contaminated soil and/or Hazardous Waste shall be:

- a) Placed on a relatively impervious surface such as asphalt, concrete or on minimum 8-mil thick polyethylene sheeting.
- b) Moistened to minimize dust emissions during stockpiling. However, no run-off shall be permitted at any time.
- c) Securely covered by 8-mil polyethylene sheeting to minimize vapor emissions and prevent run-off from rain (sheeting shall be maintained and remain in satisfactory condition),
- d) Configured in such a manner that surface water run-off from the stockpile does not carry soil, leachate, or both beyond the stockpile perimeter berm,
- e) Separated from uncontaminated soil.

The Contractor shall manage the contaminated soil properly. The City shall not be liable for contaminated soil improperly handled or disposed by the Contractor.

803-15 Disposal of Contaminated Soil

Contaminated soil that is a RCRA Hazardous Waste or Non-RCRA Hazardous Waste shall be transported to a licensed TSDF and as approved in the Hazardous Materials Submittal.

Contaminated soil that is a Regulated Waste, shall be transported to a licensed treatment facility which meets the California regional water quality control board's WDRs for that waste type and is approved in the Hazardous Materials Submittal in accordance with, 803-4, "HAZARDOUS SUBSTANCES MANAGEMENT PLAN." If the treatment facility will not accept the contaminated soil, the Regulated Waste will then be sent to a State licensed Class III landfill or other facility with WDRs that accept the Regulated Waste.

The Contractor shall obtain pre-approval for the Contractor's proposed treatment or disposal facility in accordance with 803-4, "HAZARDOUS SUBSTANCES MANAGEMENT PLAN." The Contractor shall obtain all necessary approvals and authorizations from the treatment or disposal facility and shall provide them to the Engineer and City's TEEM Program a minimum of 5 Working Days prior to scheduling transport.

The Contractor shall use a Regulated Waste or Non-Hazardous Waste Data form to document the disposal from the Work Site of the contaminated soil that is identified as Regulated Waste. The Contractor shall use a Hazardous Waste Manifest for all soils identified as RCRA or Non-RCRA Hazardous Waste.

The Contractor shall provide the Engineer and City's TEEM Program with manifests for each load at least 48 hours prior to the scheduled pickup date. The City's TEEM Program will review the manifests for accuracy. All manifests shall be signed off by the Engineer or TEEM Program on the date of loading and transport. Copies of executed manifests and treatment or disposal certificates shall be provided to the Engineer and City's TEEM Program as specified in 803-4, "HAZARDOUS SUBSTANCES MANAGEMENT PLAN."

The Contractor shall manage the contaminated soil properly. The City shall not be liable for contaminated soil improperly handled or disposed by the Contractor.

803-16 PAYMENT. Payment for waste management shall be included in the applicable Bid items.

- a) Preparation of Hazardous Waste Management Plan and Reporting (LS)
- b) Monitoring, Testing, Sampling, Site Storage, and Handling of Soils Containing RCRA Hazardous Waste (ton)
- c) Loading, Transportation, and Disposal of soils containing RCRA Hazardous Waste (ton)
- d) Monitoring, Testing, Sampling, Site Storage and Handling of Petroleum Contaminated Soil (ton)
- e) Loading, Transportation, and Disposal of Petroleum Contaminated Soil (ton)
- f) Monitoring, Testing, Sampling Site Storage and Handling of Soils Containing Non-RCRA Hazardous Waste (ton)
- g) Loading, Transportation, and Disposal of Soils Containing Non-RCRA Hazardous Waste (ton)
- h) Testing, Sampling, Site Storage, Handling, Transportation, and Disposal of Containerized RCRA Hazardous Waste (55 gallon drum)
- i) Testing, Sampling, Site Storage, Handling, Transportation, and Disposal of Containerized Non-RCRA Hazardous Waste (55 gallon drum)
- j) Testing, Sampling, Site Storage, Handling, Transportation and Recycling/Disposal of Universal Waste (per item)
- k) Testing, Sampling, Site Storage, Handling, Transportation and Recycling/Disposal of Regulated Waste (ton)
- l) RCRA Hazardous Waste Contaminated Ground Water (gallon)
- m) Non-RCRA Hazardous Waste Contaminated Ground Water (gallon)

Shorter testing time and availability of preliminary results may be required by the Engineer and paid as Extra Work.

SECTION 804 – SEWAGE SPILL PREVENTION

804-1 GENERAL. The Contractor shall observe and comply with the City's policy of zero spills. The Contractor shall be liable for all damages and fines associated with sewage spills caused by improper support or damage to the existing sewer facilities.

804-2 SEWAGE SPILL PREVENTION AND RESPONSE PLAN. Prior to the start of construction, the Contractor shall develop and submit to the Engineer, for review and approval, a written Sewage Spill Prevention and Response Plan. The plan shall include sewage spill response plan, spill containment and cleanup plan, staging area, and sewage bypass and pumping plan.

The Sewage Spill Prevention and Response Plan shall be developed to respond to any construction related sewage spill(s). The plan shall include:

- a) Identifying all nearby environmentally-sensitive areas such as waterways, channels, catch basins and entrances to existing underground storm drains.

- b) Making arrangements for an emergency response unit, stationed at or near the Site, comprised of emergency response equipment and trained personnel to be immediately dispatched in the event of a sewage spill(s). This includes field biologists, archaeologists, or both if in an environmentally-sensitive area such as a canyon.
- c) Developing an emergency notification procedure that includes an emergency response team with telephone numbers and arrangements for backup personnel and equipment. The emergency response unit shall be able to dispatch to the Site 24 hours a day 7 days a week including weekends and holidays. The Contractor shall designate primary and secondary representatives, their respective phone numbers, pager numbers, and mobile phone numbers. These Contractor's representatives shall be accessible and available at all times to respond immediately to any sewer spill event.
- d) Identifying any property owners who may be affected e.g., the City Park and Recreation Department.

At the pre-construction meeting the Contractor will be provided with a list of the City representatives to contact in case of sewage spill(s). In case of a sewage spill(s), the Contractor shall immediately call the Sewage Spill Hotline number at (619) 527-5481 and shall act immediately without instructions from the City, to control the spill and take all appropriate steps to contain it in accordance with the Sewage Spill Prevention and Response Plan and 804-2.1, "Sewage Bypass and Pumping Plan." The Contractor shall immediately notify the City representatives of the spill and shall report Project name, location, Contractor name, Project Engineer, and Engineer names.

The Contractor shall, within 3 Working Days from the occurrence of the spill, submit to the Engineer a written report describing the following information related to the spill: the location; the nature and estimated volume; the date and time; the duration; the cause; the type of remedial and/or clean up measures taken (including erosion control measures) and the date and time of implementation; the corrective and/or preventive actions taken to avoid further spills; equipment used in spill response; and the environmentally-sensitive habitat such as a water body, if any, impacted and results of any necessary monitoring. The Contractor shall provide a list of who from the City was notified, date and time of notification, date and time the Contractor was notified of the spill, date and time the Contractor arrived on Site.

The Engineer may institute further corrective actions, as deemed necessary, to fully comply with existing laws, ordinances, codes, order or other pertinent regulations. In addition to any penalties provided by federal, state, and local laws, the Contractor shall be responsible for all costs incurred for the corrective actions including mitigation measures (habitat restoration, etc.) and obtaining after-the-fact permits if necessary, in environmentally sensitive areas. These permits include but are not limited to those from the City Planning Department Development Services, California Coastal Commission, U.S. Army Corps of Engineers and the California Department of Fish and Game.

It shall be the Contractor's responsibility to assure that all field forces, including Subcontractors, know and obey all safety and emergency procedures, including the Sewage Spill Prevention and Response Plan applicable to the work, to be maintained and followed at the Site. If in an environmentally sensitive area, such as canyon, stream, or lagoon, impacts shall be minimized. Crews shall be aware at the start of the job of any sensitive environmental habitats, breeding season restrictions, etc.

The Contractor shall take extreme care to prevent spills when working on sewer lines such as when making temporary connection and when connecting new lines into the sewer system. The Contractor shall not trap debris and discharge rock or debris downstream. Avoidance of streams is paramount unless authorized via permits.

The Contractor shall defend, indemnify, protect, and hold harmless the City, its agents, officers, and employees, from and against all claims asserted, or liability established for damages or injuries to any person or property resulting from any sewage spill caused or claimed to be caused by the Contractor's action or failure to take measures to prevent a spill. The Contractor shall be responsible for payment of any fines assessed against the City for such sewage spills. The Contractor's duty to indemnify and hold harmless shall not include any claims or liability arising from the established active or sole negligence or willful misconduct of the City, its agents, officers or employees.

The Contractor shall obtain and maintain an additional insurance coverage for Pollution Liability with its limits and requirements as set forth in 7-3.5.3, "Contractors Pollution Liability Insurance Endorsements." The limits and requirements for Pollution Liability shall be in an amount sufficient to cover potential losses from sudden and accidental pollution. Unless otherwise provided for in the Bid Proposal, all costs associated with the requirements for Sewage Spill Prevention and Response Plan, including additional insurance, shall be included in the prices for other related Bid items.

804-2.1 Sewage Bypass and Pumping Plan. The Contractor shall submit to the Engineer for approval, a Sewage Bypass and Pumping Plan at least 15 Working Days prior to implementation of flow diversion in compliance with the City's policy of "ZERO SPILLS." The Sewage Bypass and Pumping Plan shall indicate the sequence of diversion operations, and all other operations the Contractor will establish to maintain wastewater service during the construction period. The Sewage Bypass and Pumping Plan shall include an emergency response plan indicating the procedures, equipment, and activities that will be implemented in the event of an emergency shutdown or failure of the flow diversion equipment used for construction. The Contractor shall be responsible for implementation of the emergency plan in accordance with 804-2 "Sewage Spill Prevention and Response Plan".

The Contractor's Sewage Bypass and Pumping Plan shall be reviewed and approved by the Wastewater Collection Division of the City before flow can be diverted. No deviation from the approved Sewage Bypass and Pumping Plan will be allowed without prior approval from the Engineer.

The Contractor shall observe and comply with all Federal, State, and local laws, ordinances, codes, orders, and regulations which in any manner affect the conduct of the work, specifically as it relates to sewage spills. The Contractor shall be fully responsible for preventing sewage spill(s), containing any sewage spill(s), recovery and legal disposal of any spilled sewage, any fines, penalties, claims and liability arising from negligently causing a sewage spill(s), and any violation of any law, ordinance, code, order, or regulation as a result of the spill(s).

The Contractor shall exercise care not to damage existing public and private improvements, interrupt existing services or facility operations which may cause a sewage spill(s). Any reasonably anticipated utility or improvement which is damaged by the Contractor shall be immediately repaired at the expense of the Contractor. In the event that the Contractor damages an existing utility or interrupts an existing service, which causes a sewage spill(s), the Contractor shall immediately call the emergency number at (619) 515-3525.

The Contractor shall exercise care not to damage any sensitive habitats or historic resources unless authorized via the discretionary permit and Mitigation, Monitoring and Reporting Program approved by the City.

The Contractor shall provide all facilities, labor, power, and appurtenances necessary to divert wastewater flows as necessary to allow proper installation of the pipeline and/or manhole linings.

The Contractor shall submit as part of their Sewage Bypass and Pumping Plan their monitoring procedure and frequency and shall continuously monitor the flow levels downstream and upstream

of the flow diversion to detect any possible failure that may cause a sewage backup and spill(s). The Contractor shall maintain a log of the monitoring and provide daily copies to the Engineer in a manner acceptable to the Engineer.

The Contractor shall inspect and maintain the diversion system daily, including the back-up system. The Contractor shall submit with their Sewage Bypass and Pumping Plan their maintenance procedures and frequency. The Contractor shall maintain a log of all inspection, maintenance and repair records, and provide copies to the Engineer upon request in a manner acceptable to the Engineer.

The Contractor shall size the flow diversion system to handle the peak flow and shall include a 100% backup in the flow diversion system. The Contractor shall provide temporary means to maintain and handle the sewage flow in the existing system as required to complete the necessary construction. The Contractor shall utilize the flow diversion system to mitigate any additional wet weather flows, perform the necessary maintenance and repairs on the flow diversion system, and exercise and ensure the operation of the backup system. Each pump, including the backup pumps, shall be a complete unit with its own suction and discharge piping. The Contractor shall operate the backup flow diversion system for a minimum of 25% of the total diversion time on a weekly basis. The backup flow diversion system shall be fully installed, operational, and ready for immediate use. The diversion system shall be hydraulically tested with clean water prior to wastewater flow diversion. The Contractor shall demonstrate to the satisfaction of the Engineer that both the primary and backup flow diversion systems are fully functional and adequate, and shall certify the same, in writing, to the Engineer in a manner acceptable to the Engineer.

The Contractor shall provide one dedicated fuel tank for every single pump or generator, if fuel or generator driven pumps are used. The Contractor shall provide an emergency standby power generator, if electric power driven pumps are used. The Contractor shall provide a fuel level indicator outside each fuel tank. The Contractor shall continuously (while in use) monitor the fuel level in the tanks and ensure that the fuel level does not drop below a level equivalent of two hours of continuous flow diversion system operation. The Contractor shall take the necessary measures to ensure the fuel supply is protected against contamination. This includes but is not limited to fuel line water traps, fuel line filters, and protecting fuel stores from precipitation. The Contractor shall monitor all hoses and repair leaks immediately.

804-2.2 Payment Unless a Bid item has been provided, full compensation for the Sewage Bypass and Pumping Plan, its implementation e.g., labor, facilities, equipments, power, appurtenances and incidental, shall be included in the payment for sewer main.

SECTION 805 – WATER DISCHARGES

805-1 GENERAL.

805-1.1 Hydrostatic Discharge Requirements. The Contractor shall comply with Regional Water Quality Control Board (RWQCB) Order No. 2002-0020, General Permit for Discharges of Hydrostatic Test Water and Potable Water to Surface Water and Storm Drains, the requirements outlined in the Hydrostatic Discharge Requirements Certification included **as an Appendix** in the Contract Documents.

For discharges over 500,000 gallons per day an individual Notice of Intent shall be filed by the Contractor.

Quarterly reports as required by the Order shall be submitted to the RWQCB and to the City. Reporting requirements and schedule are outlined in the Order. The Contractor shall record the results for each discharge event on the City's furnished reporting form and submit them upon completion of the Project.

805-1.2 Payment. Payment for Hydrostatic Discharge Requirements shall be included in the Bid price per linear foot for new water main.

805-2 DEWATERING. DELETE 7-8.6.4 in its entirety and SUBSTITUTE with the following:

805-2.1 General. The dewatering shall include site dewatering and treatment of contaminated water to lower and control groundwater levels and hydrostatic pressures to permit excavation and construction to be performed properly under dry conditions.

Dewatering operations shall be adequate to stabilize vertical excavations during trenching or cofferdam installation and provide for sound soil conditions suitable for sub-grade applications for the item being constructed.

Where the excavation is below the groundwater table, sheet piles shall be used and driven to a depth of at least 5' below the bottom of the excavation. For groundwater table and other information refer to the subsurface information **when provided in the Contract Documents** for this project. Dewatering shall be performed by the Contractor when specifically required by the Plans or Specifications, and as necessary for construction of the Work. Dewatering shall be performed in conformance with all applicable local, state and Federal laws and permits issued by jurisdictional regulatory agencies. Permits necessary for treatment and disposal of accumulated water shall be obtained by the Contractor. Accumulated ground water shall be treated prior to disposal **if so specified in the Special Provisions** or required by a permit.

The Contractor shall be responsible for the integrity of the finished product and the protection of adjacent structures and facilities impacted by dewatering operation.

805-2.2 Permits. Unless the type of the permit is **specified in the Special Provisions**, necessary permits from regulatory agencies or Public Utilities-Wastewater Section, if applicable, shall be obtained for disposal of water. If the Contractor decides to discharge into sewer system, the Contractor shall obtain permit from Public Utilities-Wastewater Section for discharging into sewer system as outlined in the Public Utilities-Wastewater Section policy for Ground Water Discharges attached to this contract. If the Contractor chooses to discharge into the storm drain system, the Contractor shall obtain a Regional Water Quality Control Board (RWQCB) permit.

805-2.3 Dewatering Plan. The Contractor shall submit a dewatering plan per 2-5.3, "Submittals" detailing its proposed plan and methodology of dewatering and treatment and disposal of accumulated water (when contaminated water is present) prior to commencement of excavation.

The Dewatering Plan shall include:

- a) Pump test report,
- b) identification of location, type and size of dewatering devices e.g., head and capacity of dewatering pumps and related equipment, the size and type of materials composing the collection system, the size and type of equipment to be used to retain and, if required, treat accumulated water, and the proposed disposal locations,
- c) number and location of dewatering wells,
- d) depth and size of dewatering wells,

- e) descriptions of methods and placement of equipment, as well as supporting calculations signed by a Professional Engineer registered in the State of California for dewatering of excavations,
- f) field demonstration of proposed system and verification that adequate personnel, materials and equipment are readily available, and
- g) written evidence of permission from California RWQCB or approved Public Utilities-Wastewater Section discharge permit, if not obtained by the City, original signed permits from jurisdictional regulatory agencies or written evidence that such permits are not required.

Pump test and report shall be conducted under the direct supervision of a certified hydrogeologist. The pump test shall provide adequate data to support the groundwater hydrology calculations. This submittal shall include all raw data and calculations. It shall also be signed and stamped by the certified hydrogeologist.

The Contractor shall refer to the reports prepared by the City and included in the Contract Documents in accordance with 2-7, "Subsurface Data" for the preparation of the dewatering plan.

805-2.4 Equipment. Dewatering includes well points, sump pumps, temporary pipelines for water disposal, and rock or gravel placement, sedimentation tanks, equipment necessary for the treatment of contaminated groundwater and other means and services including standby pumping equipment maintained on the jobsite continuously. The standby pumping equipment shall include at least 2 standby pumping units, secured on site, completely ready to insert into a dewatering well to prevent groundwater from rising during the course of construction.

Sufficient dewatering equipment shall be installed to pre-drain the water-bearing strata below the bottom of foundations, drains, sewers and other excavations.

The Contractor shall remove equipment when no longer required for dewatering, monitoring or water controlling operations.

The approved dewatering system shall include of a suitably sized pipeline to transport extracted groundwater from the Work Site to the indicated point of discharge as applicable under the dewatering permit in force during the dewatering operations. The alignment of this pipeline shall be subject to approval by the Engineer. Where pipeline is allowed to cross roadways or parking areas, the Contractor shall be required to install conduit below the traveled surface. The installation shall provide protection for the temporary pipeline and a smooth transition across trench having a finish of either Class-F asphalt or concrete trench cap.

805-2.5 Dewatering Operation. The Contractor shall comply with the following requirements:

- a) The hydrostatic head in water-bearing strata below foundations, drains, sewers and other excavations shall be reduced to ensure that the water level and piezometric water levels are below the excavation surface at all times. Dewatering shall be continuously maintained a minimum 3' below the excavation during the entire construction period until the backfill and compaction is completed.
- b) The dewatering system shall be placed into operation prior to excavation below ground water level to lower the ground water level and shall be operated continuously 24 hours a day, 7 days a week until drains, sewers and structures have been constructed and fill materials have been placed and dewatering is no longer required.
- c) The site shall be graded to facilitate drainage. Surface runoff shall be diverted from excavations. Water entering the excavation from surface runoff shall be collected in shallow

ditches around the perimeter of the excavation, drained to sumps, and be pumped or drained by gravity away from the excavation.

- d) Adequate control shall be maintained to ensure that the stability of excavated and constructed slopes are not adversely affected by water, that erosion is controlled and that flooding of excavation or damage to structures does not occur.
- e) Where critical structures or facilities exist immediately adjacent to areas of proposed dewatering, reference points shall be established and observed at frequent intervals to detect any settlement which may develop.
- f) Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at the proposed bottom of excavation.
- g) Flotation of structures and facilities shall be prevented by maintaining a positive and continuous removal of water.
- h) The release of groundwater to its original level shall be performed in such a manner as not to disturb natural foundation soils, prevent disturbance of compacted backfill and prevent flotation or movement of structures, pipelines, and sewers.
- i) If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas shall be excavated and replaced with drain rock at no additional cost to the City.
- j) If well points or wells are used, they shall be adequately spaced to provide the necessary dewatering and shall be sand packed and/or other means used to prevent pumping of fine sands or silts from the subsurface. A continual check shall be maintained to ensure that the subsurface soil is not being removed by the dewatering operation.
- k) Water and debris shall be disposed of in a suitable manner without damage to adjacent property. No water shall be drained into work built or under construction. Water shall be filtered to remove sand and fine-sized soil particles and further treated if required by regulatory agencies before disposal into any drainage system or sewer system.
- l) The Contractor may discharge water into the sewer system as outlined in the Public Utilities-Wastewater Section policy for Ground Water Discharges attached to this contract. The discharge points and flow data for the existing sewer system are attached to this contract **as an Appendix.**
- m) The Contractor shall maintain operation of monitoring and settlement measurement systems until their removal is approved. To the extent approved, well points and like items may be abandoned in place, otherwise all temporary dewatering, recharging facilities, or both shall be removed in a manner satisfactory to the Engineer. Any items abandoned in place shall be indicated on the Red-line Plans.
- n) The Contractor shall include adequate time in its schedule to obtain permits prior to start of construction. If required by the permitting entity, the City may assist the Contractor in obtaining permit approval.
- o) The Contractor shall comply with Order No. 2001-96, (RWQCB), San Diego Region for groundwater remediation and dewatering waste discharges to surface waters within the San Diego region or City's discharge permit, as applicable.

805-2.6 Contaminated Water.

805-2.6.1 General. Contaminated water shall mean any type of contamination present in the collected water that precludes direct discharge to the sewer or storm drain as outlined in the discharge permit issued by the respective regulatory agency.

If indicated in the Contract Documents or following groundwater testing during construction it is found to be contaminated with petroleum, the Contractor shall provide, install, maintain and operate the equipment necessary to treat the contaminated water to bring it to compliance with the dewatering and discharging permits from RWQCB, Public Utilities-Wastewater Section, or both.

For contaminated water treated as Hazardous Waste refer to Section 803 and the specifications in this subsection.

805-2.6.2 Dewatering System. The Contractor shall prepare a dewatering system with the contingency of encountering hazardous materials such as gasoline and other fuel constituents in the specified area(s). The dewatering system plan shall be designed to process contaminated groundwater with the contingency of processing flammable liquids.

If other types of hazardous constituents are encountered or are additionally encountered along with petroleum constituents or are indicated in the Contract Documents, the dewatering system shall be designed to process those contaminants in order to comply with the regulatory discharge permit.

805-2.6.3 Health and Safety Plan. The Contractor shall prepare a community health and safety plan which addresses the potential of encountering gasoline and other fuel constituents with the contingency of encountering flammable liquids in the groundwater during dewatering activities in the areas specified in the Special Provisions.

The plan shall include:

- a) an industrial hygienist to oversee the community health and safety plan and do site surveillance activities to confirm no health and safety condition exist during the Work. Include costs for the contractor to utilize and
- b) the following 3 monitoring devices with action levels identified in the Community Health and Safety plan for all subsurface work throughout the course of the entire Project:
 - a. Photo Ionization Detector (PID),
 - b. combustible gas indicator (CGI), and
 - c. Benzene monitor.

805-2.6.4 Hazardous Waste Operations and Emergency Response (HAZWOPER) Certificate. If flammable liquids or other hazardous wastes are encountered during the dewatering activities, construction staff shall be required to have a HAZWOPER certificate in compliance with CCR Title 8, Section 5192 and 29 CFR, Part 1910.

805-2.7 Payment. Payment for dewatering will be made as follows:

- a) The Allowance Bid item for Permit and Discharge Fees shall cover the payment for fees and the associated expenses e.g., water samples and lab testing for obtaining permits.
- b) The Allowance Bid item for Equipment & Set up for Contaminated Water containing non-hazardous materials e.g., sand and silt will cover the payment for Dewatering Plan, providing, and installing, the proper equipment necessary to treat the contaminated water to bring it to a level that is in compliance with the permitting agencies' requirements, and the removal of the equipment from the Site.
- c) The Allowance Bid item for Equipment & Set up for Contaminated Water containing hazardous substances will cover the payment for Dewatering Plan, providing, and installing, the proper equipment necessary to treat the contaminated water to bring it to a level that is in compliance with the permitting agencies' requirements, and the removal of the equipment from the Site.
- d) The unit price Bid item for Treatment of Contaminated Water containing non-hazardous substances covers the payment for maintaining, operating, treatment, and handling of the contaminated groundwater in compliance with the permitting agencies requirements.
- e) The unit price Bid item for Treatment of Contaminated Water containing hazardous substances covers the payment for maintaining, operating, treatment, and handling, of the contaminated groundwater in compliance with the permitting agencies requirements.

- f) The payment for preparing health and safety plan shall be included in the various Bid items unless a Bid Item has been provided.

For disposal of Hazardous Waste in contaminated water refer to Section 803.

SECTION 806 – CLEANUP AND DUST CONTROL

806-1 AFFIDAVIT OF LEGAL DISPOSAL. As a condition of Final Payment, the Contractor shall submit a signed and notarized affidavit stating that all brush, trash, debris, and surplus materials resulting from this Project have been disposed of in a legal manner. See Affidavit of Disposal, in the Contract Documents. Disposal of refuse generated as a result of this contract at the City landfills shall be subject to a fee. The cost of disposing of this refuse should be included in Contractor's Bid. Contact the Refuse Disposal Division at (858) 573-1418 for fee information.

806-2 DUST ABATEMENT. The Contractor shall carry out effective measures whenever and as often as necessary to prevent its operation from producing dust in amounts damaging to property, cultivated vegetation, domestic animals, or causing a nuisance to persons living or occupying buildings in the vicinity. The Contractor shall be responsible for any damage resulting from any dust originating from its operations. The dust abatement measures shall be continued until the Contractor is relieved of further responsibility by the Engineer.

Payment for dust abatement shall be included in the various Bid items.

806-3 RUBBISH CONTROL. The Contractor shall keep the Site and other areas used by it in a neat and clean condition; free from any accumulation of rubbish. The Contractor shall dispose of all rubbish and waste materials of any nature occurring at the Site, and shall establish regular intervals of collection and disposal of such materials and waste.

The Contractor shall keep the streets in and adjacent to the construction area and its haul roads free from dirt, rubbish, and unnecessary obstructions resulting from its operations at all times.

Equipment and material storage shall be confined to areas approved by the Engineer. Disposal of all rubbish and surplus materials shall be off the Site, at the Contractor's expense, and in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and the particular requirements of Subpart H, §1926.252 of the OSHA Safety and Health Standards for Construction.

Payment for rubbish control shall be included in the various Bid items.

SECTION 807 - RESOURCE DISCOVERIES

807-1 ARCHAEOLOGICAL, NATIVE AMERICAN, AND PALEONTOLOGICAL DISCOVERIES. If a Mitigation, Monitoring, and Reporting Program [MMRP] for Historical, Paleontological, or both resources has been prepared for the Project, then the MMRP will control in lieu of this subsection (except for reference to 6-6, "DELAYS AND EXTENSION OF TIME"), unless the MMRP is silent to these issues.

If discovery is made of items of Native American, Archaeological, and/or Paleontological interest, the Contractor shall immediately notify the Engineer and cease any soil disturbing activity in the area of discovery and any nearby area. Upon notification by the Contractor of the discovery of human remains of unknown origin, the Engineer will immediately notify the San Diego County Coroner

[Medical Examiner] at (858) 694-2895, in accordance with the California Health and Safety Code §§7050.5 and 7051.

The City will not authorize any further excavation or disturbance of the Site or any nearby area until the Medical Examiner has concluded an investigation of the circumstances, manner and cause of any death, and the recommendations concerning the treatment and disposition of the remains have been made to the City. Excavation in the areas of interest shall not resume until authorized by the Engineer in writing.

The Contractor shall make allowances for temporary work stoppages to evaluate and salvage Native American, Archaeological, and Paleontological discoveries. If suspension of construction activities for analysis, salvaging of resources, or both exceed 5 Working Days along the entire alignment, the Contractor shall be entitled to an extension of time in accordance with the provisions of 6-6, "DELAYS AND EXTENSIONS OF TIME." Payment for Work delays in excess of the 5 Working Days shall be included in the Bid item for Suspension of Work - Resources.

Discoveries which may be encountered include, but are not limited to, fossil resources, historic or prehistoric human bones or remains, animal bones or remains, stone implements or other artifacts and/or remnants of dwelling sites, and any items created or altered by humans more than 45 years ago, excluding pipes, laterals and appurtenances.

There are severe civil and criminal consequences for failure to treat Native American, Archaeological, Paleontological, or both discoveries in accordance with local, State, and Federal laws. The Contractor shall notify Subcontractors and Suppliers of the requirements of this subsection.

The Contractor shall indemnify and hold the City, its officers and employees, harmless from any claims asserted or liability established, including penalties from local, state or federal agencies, arising from the failure of the Contractor, Subcontractors or Suppliers, to notify the Engineer of such discoveries in accordance with this subsection.

807-1.2 Archeological and Native American Monitoring Program. Unless specified otherwise in the Contract Documents, the Contractor shall retain a qualified archaeologist approved by the City's Environmental Analysis Section (EAS). The archaeologist shall retain the appropriate Native American representative. Archeologist and the Native American representative shall attend the pre-construction meeting. The areas shown on the Plans subject to monitoring are approximate. The archaeologist shall confirm the sites and implement the required monitoring **per Appendix "A".**

Unless included in the payment for the proposed item of Work e.g., utility main, the full compensation for archaeological and Native American monitoring program and report preparation, **as prescribed in Appendix "A",** shall be included in the contract Bid item for archaeological and Native American monitoring program.

In the event of a significant discovery, the Contractor shall be entitled to additional compensation in accordance with 3-3, "Extra Work", for implementation of a Mitigation Program **as set forth in Appendix "A".**

807-1.3 Paleontological Monitoring Program. Unless specified otherwise in the Contract Documents, the Contractor shall retain a qualified paleontologist approved by EAS. The paleontologist shall attend the pre-construction meeting. The areas shown on the Plans subject to monitoring are approximate. The paleontologist shall confirm the sites and implement the required monitoring **per Appendix "A".**

Unless included in the payment for the proposed item of Work e.g., utility main, the full compensation for paleontological monitoring program and report preparation, **as prescribed in Appendix "A"**, shall be included in the Contract Bid item for paleontological monitoring program.

In the event of a significant discovery, the Contractor shall be entitled to additional compensation in accordance with 3-3, "Extra Work," for implementation of a Mitigation Program **as set forth in Appendix "A"**.

807-1.4 Archaeological and Native American Mitigation and Curation. In the event of a significant Native American or archaeological discovery and after consultation with EAS staff, the Contractor shall implement a mitigation program **as set forth in Appendix "A"**. In accordance with the Mitigation and Monitoring Reporting Program, the mitigation program shall include but not be limited to, preparation and implementation of a research design and data recovery program, recovery, sorting, cleaning, cataloging/identifying/analyzing, curation (bagging, placement into archival boxes, delivery to an appropriate institution, and any fees required by the institution), and reporting, of artifact remains.

Work for mitigation shall be paid from the Allowance Bid item for Archaeological and Native American Mitigation and Curation. The Contractor shall provide the Engineer with invoices for the Work performed and be reimbursed from the amount allocated.

807-1.5 Paleontological Mitigation and Excavation. In the event of a significant paleontological discovery and after consultation with EAS LDR staff, the Contractor shall implement a mitigation program **as set forth in Appendix "A"**. In accordance with the Mitigation and Monitoring Reporting Program, the mitigation shall include excavation for recovery, sorting, cleaning, cataloging/identifying/analyzing, delivery to an appropriate institution, and any fees required by the institution, and reporting, of fossil remains.

Work for mitigation and related excavation shall be paid from the unit price Bid item for Paleontological Mitigation and Excavation. Excavation Work over 10' deep or as determined by the paleontologist of areas outside of the trench for further recovery of fossils (e.g. test pits) shall be paid for from the unit price Bid item for Paleontological Mitigation and Excavation. The excavation work shall include coordination of all parties involved and traffic control for a period of up to 2 weeks.

SECTION 808 - ASBESTOS MATERIALS

808-1 GENERAL. If the Contractor identifies asbestos containing materials (ACM) at the Work Site, the Contractor shall immediately stop Work in the affected area and notify the Engineer unless the Contract Documents show the presence of such materials.

808-1.1 Non-Friable Asbestos Cement Pipe (ACP). The Contractor shall take adequate care to maintain the materials in a non-friable condition. The Contractor shall be responsible for ACM removal and associated contamination clean-up resulting from improper handling that makes material friable.

Removal of ACP shall be in whole sections where possible. The Contractor shall comply with the following requirements for ACP that is to be cut or broken:

- a) Evacuate the area of unauthorized personnel, post warning signs, and provide adequate barriers to keep unauthorized personnel out of the area.
- b) Provide the workers performing the cutting or breaking of asbestos material with personal protective equipment i.e., a respirator and disposable clothing in compliance with respiratory

protection requirements of EPA or Title 8, §5414 (whichever is the more stringent) as applicable to the Work.

- c) Cutting or breaking of asbestos material to facilitate removal shall be in compliance with California Regulations, Title 8, §1529. The Contractor shall only perform cutting of ACP using a hydraulic snap cutting method. All powered and hand operated saws shall not be allowed.
- d) If a collar needs to be broken to remove the whole ACP sections, a wet cloth shall be placed on the collar and water shall be used throughout the process to wet the collar. Minimal force shall be used to break it into as few large of pieces as possible. Area to be cut or broken shall be adequately wetted with amended water to reduce fiber emission. Method employed by the Contractor shall be determined to minimize fiber release. Related debris from the cutting or breaking of asbestos material shall be considered friable.
- e) ACP shall be wrapped in 6 mil polyethylene sheeting or bags, sealed with appropriate tape, and properly labeled and removed away from the construction area so it will not be damaged by the heavy equipment.
- f) The Contractor shall transport the wrapped and sealed ACP to a designated secure disposal bin on the Site no later than the end of each Working Day. Bin shall be lockable or it shall be located within a secure construction area.
- g) The Contractor shall comply with City of San Diego Miramar Landfill Acceptance Criteria for the Disposal of Non-Friable Asbestos Waste requirements. A copy of the requirements is available by calling (858) 573-1415 or on-line at: <http://www.sandiego.gov>
- h) The Contractor shall be responsible for providing its own certification of non-friability.
- i) The Contractor shall provide notice to the Engineer a minimum of 5 Working Days prior to transportation of the ACP disposal bins or friable asbestos waste. Copies of all manifests shall be submitted to the Engineer for review 48 hours in advance of transport.
- j) Only the City's Asbestos and Lead Program representative shall sign the manifests as the generator.
- k) Friable asbestos wastes are regulated as hazardous waste (California Code of Regulations, Title 22, Division 4.5, Chapter 11, Article 3, §66261.24) and shall be transported by a licensed hazardous waste hauler and disposed of an appropriate landfill.

808-1.1.1 Asbestos Cement Pipe Training. The Contractor shall comply with the provisions of California Title 8, §5208 and §1529, and Title 40 CFR Part 61. The Contractor's workers handling ACP shall be trained in accordance with Title 8 CCR §1529, regarding the dangers inherent in handling asbestos materials and breathing asbestos dust, proper work procedures, and personal and area protective measures. Topics covered in a state accredited course for ACP shall include the following:

- a) Methods of recognizing asbestos.
- b) Health effects associated with asbestos.
- c) Relationship between smoking and asbestos in producing lung cancer.
- d) Nature of operations that could result in exposure to asbestos.
- e) Importance of and instruction in the use of necessary protective controls, practices and procedures to minimize exposure including:
 - i. Purpose, proper use, fitting, instructions and limitations of respirators as required by 29 CFR 1910.134.
 - ii. Appropriate work practices for the ACP work. Work practices shall include hands-on training.

808-1.1.2 Asbestos Cement Pipe Submittals. The Contractor shall submit the following information to the Engineer in accordance with 2-5.3, "Submittals:"

Prior to Start of the Work:

- a) A work plan showing the means and methods of performing the Work, disposal bin location and how it will be secured, information about the disposal transporter and disposal location, and how the Contractor will handle friable asbestos waste if any is generated.
- b) Copies of notifications made to regulatory agencies, if required.
- c) Evidence that workers handling ACP have been trained, certified, and accredited as required by law.
- d) If respirators are going to be used for the non-friable work, submit doctor's report from medical examination conducted within the last 12 months as part of compliance with OSHA medical surveillance requirements for each worker who is to enter the Site. The Contractor shall submit, at a minimum, the following for each worker:
 - i. Name and Social Security Number.
 - ii. Physician's written Opinion from examining physician including the following:
 - A. Whether worker has any detected medical conditions that would place the worker at an increased risk of material health impairment from exposure to asbestos.
 - B. Any recommended limitations on the worker or on the use of personal protective equipment such as respirators.
 - C. Statement that the worker has been informed by the physician of the results of the medical examination and of any medical conditions that may result from asbestos exposure.

The Contractor shall not start Work until the submittals are returned with the City's Asbestos and Lead Management Program's written approval.

After the Start of the Work:

- a) Copies of all waste shipment records.
- b) Copies of all air monitoring results taken during the removal in compliance with OSHA. Air sample results shall be submitted to the Engineer within 24 hours.

808-1.2 Friable Asbestos. Any friable asbestos (material that can be crumbled, pulverized, or reduced to powder in hand) or soil that is contaminated with friable asbestos are regulated as hazardous waste (California Code of Regulations, Title 22, Division 4.5, Chapter 11, Article 3, §66261.24). The City reserves the right to select another qualified contractor to perform the Work related to friable asbestos materials.

808-1.3 Payment. Payment for the handling and disposal of asbestos-containing materials shall be in accordance with 3-2.4, "Agreed Prices" unless a Bid item has been provided for Handling and Disposal of Non-friable Asbestos Material.

SECTION 809 – GREEN BUILDINGS (FOR DESIGN-BUILD CONTRACTS)

809-1 LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED) REQUIREMENTS. The Project design and construction shall comply with City Council Green Building Policy 900-14, incorporated herein by this reference. The details of this council policy can be found by contacting the City Clerk's office or web site. New or significantly remodeled City facilities shall be designed and constructed to achieve energy consumption levels at least 15% below the then current Title 24 standards. An average pay-back period of 5 years shall be used as a guide for the aggregate of all energy efficiency measures included in the Project. Design-Builder shall submit and obtain LEED Silver Rating

Certification from the United States Green Building Council for building projects over 5,000 square feet. In the initial stages of the project, the Design-Builder shall research the available local and federal incentive programs **specified in the special provisions** and coordinate with and assist the City for implementation.

809-2 ENERGY SAVINGS. When preparing Plans and Specifications, the Design-Builder shall consider technological advances in energy conservation devices such as lighting and Heating Ventilation, Air Conditioning (HVAC), and photovoltaic systems and motors which enable additional energy savings over that required by the State of California Title 24 Energy Standards. The Design-Builder shall be responsible for preparing a cost savings comparison of such devices for City review. The purpose of the comparison is to identify the additional initial cost of such devices, versus their long-term energy savings. The Design-Builder shall prepare a cost savings matrix that lists each device being considered and 1, 3, 5, and 10-year projected savings, or a life cycle analysis of the proposed device compared with an energy savings alternate. The simple payback method of calculation shall be used, with the result in years. The comparison shall include, but not be limited to, the following devices: lighting, HVAC, water, heating, and motors.

(((((((((((((((END OF CITY SUPPLEMENT)))))))))))))))

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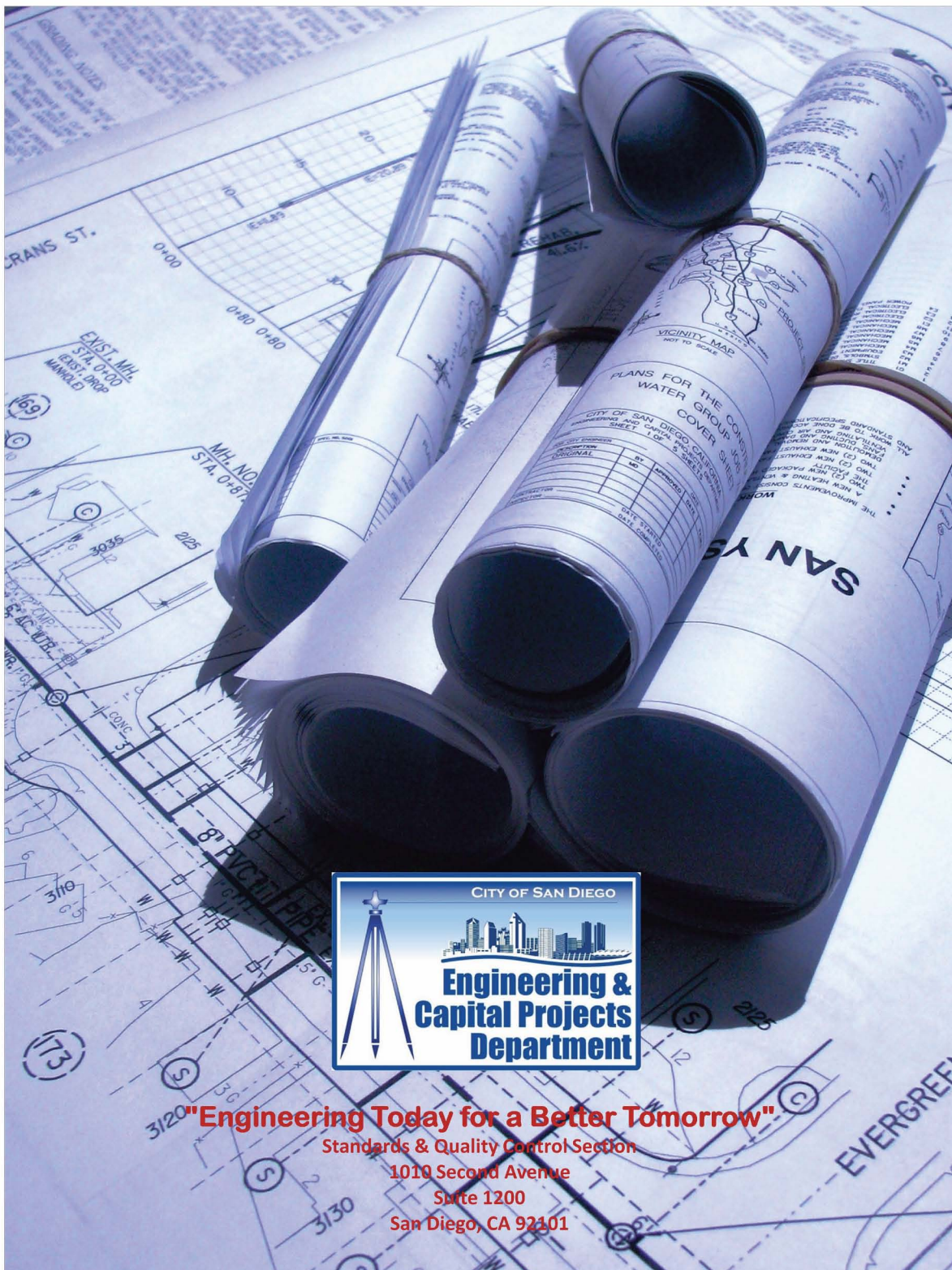
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